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GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS  
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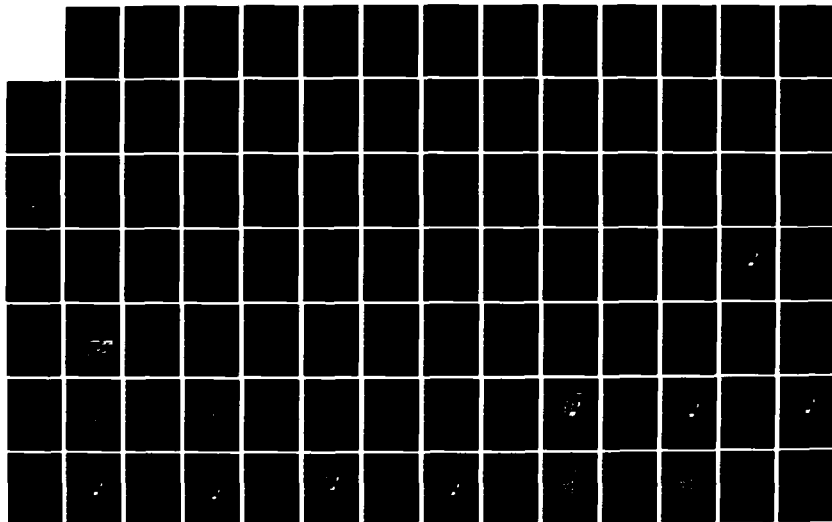
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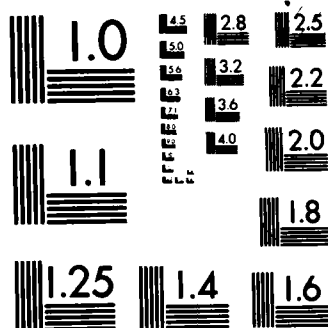
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GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS  
VOLUME III: OPERATIONAL PLANS

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JUNE 23, 1983

FINAL REPORT

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UNITED STATES MARINE CORPS  
MARINE CORPS DEVELOPMENT AND EDUCATION COMMAND  
QUANTICO, VIRGINIA 22134

D 034/RJY/jmf  
3913  
10 August 1983

From: Commanding General  
To: Distribution List

Subj: General Urban Warfare Amphibious Logistics Applications Study

1. The objectives of the study were:

a. Identify the role of logistics during combat in an urban area and isolate logistic peculiarities.

b. Identify requirements for specialized logistic concepts and systems for urban warfare.

c. Analyze present equipment inventories and mid-range equipment characteristics to satisfy urban area performance requirements and provide adequate throughput in an urban port facility.

d. Examine level of effort and support required by both the Naval Force and Landing Force/MAF to maintain command, control and coordination of logistics systems and equipment in an urban environment.

e. Evaluate performance capabilities and requirements of combat service support systems to function efficiently and effectively during operations in urban port areas.

f. Evaluate the capability of present state-of-the-art logistics systems to survive and operate in urban areas through all tempos of combat.

g. Develop land management techniques to provide combat service support in urban environments.

2. The objectives of the study were met.

3. The recommendations as set forth in the study are concurred in with the exception of recommendation 7.4.9. It is neither appropriate nor necessary to designate specific types of ships or aircraft to perform shuttle functions between the AOA and theater support facilities.

4. A copy of this letter will be affixed inside the front cover of each copy of the final report prior to its distribution.

J. E. HOPKINS  
Deputy for Development



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10 August 1983

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June 23, 1983

BDM/W-81-410-TR

Prepared for Naval Civil Engineering Laboratory, Port Hueneme, CA.

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SUMMARY

## SUMMARY

### A. BACKGROUND

The Marine Corps has identified a likelihood of combat in an urban environment. The capability to apply force in such areas is important and may be the key to achieving political and military objectives in a given circumstance. A requirement exists, therefore, for employing amphibious forces against urban targets located along the littorals of the world.

This analysis was undertaken in support of a program established to identify logistic requirements peculiar to the defense of a highly urbanized area. The area designated is SYNTHETIC CITY (SYN City), a map product and data base which provide an unclassified urban setting for examining tactical and logistical problems. Chapter I of this volume provides a brief description of SYN City.

Volume III of this investigation is a technical report in which the combat service support functions are defined in relation to their applicability to the defense of an urban area. This examination is based upon a family of operation plans, with their associated logistic annexes, having as their objective the defense of SYN City. Those plans comprise Volume IV of this analysis.

The study of general urban warfare amphibious logistics applications is undertaken in two phases. Phase I is concerned with the offensive posture, which is reflected in Volumes I and II of this study effort. Phase II is concerned with the defensive posture, reflected in Volumes III and IV. Volume V is an Executive Summary highlighting the significant findings of the overall study.

B. OBJECTIVES

- Identify the role of logistics during the defense of an urban area and isolate peculiarities.
- Identify requirements for specialized logistic concepts and systems for defensive urban warfare.
- Analyze present equipment inventories and mid-range equipment characteristics to satisfy urban area performance requirements and provide adequate throughput in an urban port facility.
- Examine level of effort and support required by both the Naval Force and Landing Force/VII MAF to maintain command, control and coordination of logistics systems and equipment in an urban environment.
- Evaluate performance capabilities and requirements of combat service support systems to function efficiently and effectively during defensive operations in urban port areas.
- Evaluate the capability of present state-of-the-art logistics systems to survive and operate in urban areas through all tempos of defensive combat.
- Develop land management techniques to provide combat service support in urban environments.

C. TECHNICAL REQUIREMENTS

- All functions defined in FMFM 4-1, "Combat Service Support for MAGTF (Draft)," shall be defined in detail as to when and what extent these functions relate to the defense of an urban area.
- The definition of support functions shall include quantities, levels of effort, and support necessary for the Naval and USMC forces to provide complete combat service support.
- All CSS requirements or lack of requirements shall be identified.
- All deficiencies identified by the contractor shall be noted and wherever possible remedial recommendations shall be made.
- Usage rates for all classes of supply shall be developed by the contractor for defensive operations in the SYN City environment.
- All equipment, techniques and methodologies shall be capable of functioning successfully within the 10th and 90th percentile range of the parameters identified for SYN City.
- Planning considerations, methodology, and prioritized planning criteria shall be developed to provide for the requirements.
- All data base elements utilized shall be noted, as shall be noted all missing or desirable data elements which could have enriched the final documents.

#### D. METHODOLOGY

The Government provided six defensive mission statements derived from Marine Corps Development and Education Command (MCDEC) Study 30-77-01. Each of the mission statements directs that defensive operations be conducted to defend SYN City until the arrival of follow-on forces.

The mission statements are included in Chapter III, "Concepts of Operations - Current Time Frame," of this Volume and in each of the Oplans contained in Volume IV. Broadly stated, the missions are as follows:

- |                            |                             |
|----------------------------|-----------------------------|
| 1) Defense Inside the City | 2) Defend Key Sectors       |
| 3) Entrap and Ambush       | 4) Defense in Depth         |
| 5) Mobile Defense          | 6) Defense Outside the City |

Concepts of operations were developed for each mission statement for the current time frame and for the mid-range period. The force used throughout is a composite Marine Amphibious Force, dubbed VII MAF to avoid confusing it with any of the three existing active MAFs or the Reserve MAGTF, IV MAF. The ground, air, and service elements are also described as composite units: 7th Marine Division, 7th Marine Aircraft Wing, and 7th Force Service Support Group. A MAF-sized force was deemed necessary to defend SYN City because of the increased threat posed by the approach of two aggressor motorized rifle divisions plus an airborne division.

The Defense Inside the City mission in the current time frame was selected as the base case. A detailed operation plan with appropriate logistic annexes was developed for this case. Outline plans were then prepared for the remaining five missions in the current time frame. A concept plan was developed for the Defense Inside the City mission in the mid-range

period, and, again, outline plans were prepared for the remaining five missions. These plans, which comprise Volume IV of this study, provided the basis for examining combat service support functions as they relate to the defense of an urban area.

The Threat force, designated by the Government, consisted of two Aggressor MRDs, an Abn Div, plus other reinforcing units. Analysts deployed the Aggressor Combined Arms Army with one MRD northwest of SYN City and the CAA(-) southwest of the city. Remnants of the MRD, from the offensive phase, reinforced the newly designated threat.

A literature search was undertaken to compile Fleet Marine Force Manuals (FMFMs) and other doctrinal publications, Marine Corps Orders applicable to the preparation of operation plans and logistical analyses, official studies bearing on amphibious operations and logistics, studies and other documents relating to urban warfare, and opposing forces doctrine, tactics, and techniques. Discussions were held with military officers on active duty and with civilian technicians and staff personnel in the Department of Defense concerning matters of interest in amphibious operations, logistics, and urban combat.

Analysts reviewed historical examples of urban combat, examined the mission statements, evaluated the Aggressor courses of action, and developed concept statements describing how each of the missions would be accomplished. These concepts were then evaluated with respect to Marine Corps doctrine, resources, training and development, and capabilities and constraints. These steps resulted in articulation of the concepts of operations for each of the operation plans that were prepared.



Throughout the preparation of the operation plans, the combat service support functions identified in FMFM 4-1, "Combat Service Support for Marine Air Ground Task Forces (Draft)," were studied to determine when and to what extent they relate to defensive operations in an urban environment. Combat service support requirements are set forth in the appropriate annexes to the family of Oplans in Volume IV, and they are elaborated on in selected portions of this volume. Planning considerations uniquely applicable to logistics during an urban defense were identified in the course of the research for and preparation of the plans; they are described in Chapter V of this volume.

#### E. TECHNICAL REPORT ORGANIZATION

This technical report, Volume III of the Phase II study effort, is presented in the following general sequence and format:

CHAPTER I - Introduction and general description of SYNTHETIC (SYN) CITY.

CHAPTER II - Introduction to urban warfare, urban characteristics, and the manner in which Aggressor forces normally assault into an urban environment.

CHAPTER III - Overview of urban defensive concepts presented in MCDEC Study 30-77-01 and their application to Operation BREAKER in SYN City. General and special situations are provided as to set the stage for the defensive concepts.

CHAPTER IV - Description of differences in defensive operations in the 1990 time-frame and their impact on a defense of SYN City. Both tactical and logistic impacts of anticipated mid-range equipment introductions are noted.

CHAPTER V - The "heart" of the technical report. Each of the 24 CSS functions is addressed in relation to the defense of an urban environment (SYN City) and the particular combat requirements of Operation BREAKER SIX. Any necessary departures from standing operating procedures are detailed and recommendations to correct potential CSS deficiencies are made where appropriate.

CHAPTER VI - Description of the resources typically available in an urban area and those that will be utilized by VII MAF during the course of the SYN City defense. Priorities for resource utilization are also discussed in relation to an urban defense.

CHAPTER VII - Development of usage rates for all classes of supply in the context of Operation BREAKER SIX.

CHAPTER VIII - Further evaluation of the SYN City Data Base developed under NCEL contract N68305-79-C-0037. The comments provided are in addition to those contained in Volume I, Chapter VIII. This evaluation may serve to provide a basis for further development of the technological data base.

APPENDIX A - Provides detailed results from automated fuel consumption analysis. Information presented in this appendix is summarized in Chapter VII - Class III - POL.

## F. CONCLUSIONS AND RECOMMENDATIONS

### 1. Operational Considerations

Analysts studied each of the defensive missions outlined in USMC SCN 30-77-01 and developed course of action options to accomplish the tasks mentioned or implied within each mission statement. The missions and tactical options were then compared with one another to determine which of the defensive concepts best suited the SYN City environment and provided the greatest probability of success given the magnitude of the approaching threat and the time available to prepare for his arrival. (VII MAF was given the mission to defend SYN City late on D+10 when the Aggressor Combined Arms Army was 3-days distant.) The base case mission, Defense Inside the City, was analyzed in depth in Volumes III and IV, and other defensive missions were examined in relation to the base case mission.

While five of six defensive missions involved an extensive utilization of urban terrain for the deployment of tactical and logistic units, one option (Defense Outside the City) placed a greater emphasis on the use of terrain outside the city. Defense Outside the City, a viable defense option under normal circumstances, was not considered for selection as the base case mission due to the fact that the character of combat, combat support, and combat service support was not urban-unique. In addition, insufficient time was available to deploy 7th MarDiv within the MAF Security Zone, establish forward CSS activities, and adequately prepare the terrain for the arrival of the Aggressor less than two days later.

The mission to defend inside the city was selected as the base case because it provided an opportunity to combine elements of other defensive missions within the city, permitted an analysis of urban-unique CSS requirements (once GOP forces had withdrawn inside the FEBA), and provided the most logical continuity between the offensive phase and the defensive phase of the SYN City operation. Major subordinate commands would remain in their TAORs that had been consolidated by the conclusion of assault operations.

Several general provisions were made for the defense of SYN City. Tank-heavy MCATFs were deployed to the limits of the FBHL/GOPL to engage Aggressor forces with long-range fires, delay the advancing columns in the security zone long enough so that adequate defensive preparations could be completed within the city, and canalize forces successful in penetrating the security zone into prepared killing zones in or near the Forward Defense Area within the city. The main defensive forces within the city were oriented on major approach corridors into the city and deployed in depth (within the limitations imposed by 23 km of frontage) forward of key logistic support installations. Strong mobile reserves, comprised of the reconfigured MCATFs, were retained either in MAF or Division reserve to provide strike forces for counterattacking successful penetrations of the FEBA and/or conducting ambushes on enemy forces entering prepared killing zones.

The remaining defensive missions within the city contain many tactical and logistic concepts common to the base case mission (Defense Inside the City) and are developed in concept and outline plans contained in Volume IV. The Defense in Depth mission was considered to be virtually identical to the base case at the MAF level. Although it was not explicitly stated in the Defense in Depth and Mobile Defense mission statements, analysts viewed these defensive concepts as containing the implicit mission to defend existing CSSAs and landing beaches to assure uninterrupted CSS support for defending units of VII MAF. Units were positioned in depth forward of these installations similar to the unit deployments in the base case mission.

In each of the inner-city defense concepts, except for Entrapment and Ambush, strong mobile reserve/strike forces were retained by the MAF and by the division to counterattack Aggressor forces successful in penetrating the FEBA and/or entering prepared killing zones. Virtually the same killing zones were used in the Entrapment and Ambush mission, however, armor assets were either attached to or joined their parent organization (7th MarDiv) to reinforce infantry units near assumed penetration points. Reinforced infantry battalions within each defensive sector were used to launch local counterattacks. It should be noted that the MAF would be in an extremely unfavorable position if major defensive elements were concentrated about anticipated penetration points and the Aggressor succeeded in penetrating the defensive perimeter at other locations, hence the need for mobile reserve/strike forces.

The limited amount of time available for defensive preparations, the geographical layout of SYN City (short distance from metropolitan boundary to water's edge), and the limited information concerning the terrain outside the city pressed in favor of adoption of a defense inside the city. The six defensive missions are ranked below in terms their estimated probability of success, all other factors remaining the same. This ranking would obviously be subject to change based on the specific urban area to be defended and the amount of time available to prepare for that defense.

- 1 { DEFENSE INSIDE THE CITY  
DEFENSE IN DEPTH
- 2 DEFEND KEY SECTORS
- 3 MOBILE DEFENSE
- 4 ENTRAP AND AMBUSH
- 5 DEFENSE OUTSIDE THE CITY

## 2. Combat Service Support Considerations

The impressive artillery capability organic to the Aggressor Combined Arms Army approaching SYN City led analysts to question the ability of centralized combat service support activities (CSSAs 1 and 2), established during offensive operations before the defensive mission was received, to provide an adequate level of service support under all tempos of combat and interdiction. Analysts examined possible alternatives and selected a combat service support concept involving a decentralization of essential service support and supply storage. This decentralization is necessary during defensive urban combat to provide more responsive and survivable CSS closer to the tactical units who are the actual recipients of such support. Terrain factors within SYN City provided an additional impetus for the decentralization of combat service support activities.

The CSS decentralization desired for all defensive missions within the city requires the establishment of Intermediate Support Points (ISPs); one ISP is established in a favorable location within each regimental sector of responsibility. Selected elements of the FSSG will be deployed to each of the ISPs and tasked to provide forward maintenance, medical, supply, engineer, and motor transport capabilities. The remainder of the FSSG will remain deployed at the two CSSAs. The establishment of ISPs, accomplished prior to the Aggressor arrival at the FEBA, will decentralize CSS activities as well as provide protected storage for essential supplies. FSSG resources are considered to be marginally adequate to accomplish the required degree of decentralization.



It is desired that supplies be further decentralized by storing designated levels of selected supplies on unit positions. For example, 2 DOS of Class I and V(W) items will be stored at each company-level group of positions while an additional 3 DOS of Class I and V(W) plus 5 DOS of Class IV and Class VIII will be maintained in each battalion rear area. This forward stockage of supplies will permit units in direct contact to continue intense combat without fear of running short of essential items as a result of possible interdiction of unit distribution resupply efforts. Additionally, units will be able to "fall back" on their supplies if they are compelled to yield ground. Any supplies abandoned on position will be denied to the Aggressor. The figure below shows tentative locations of CSSAs and Intermediate Support Points within SYN City.

Combat service support considerations relevant to a Defense Outside the City mission are largely nonurban in nature and are not addressed in any great detail. CSSAs 1 and 2 will continue to provide the interface with external logistic support while forward-deployed CSSAs will provide combat service support to deployed units.

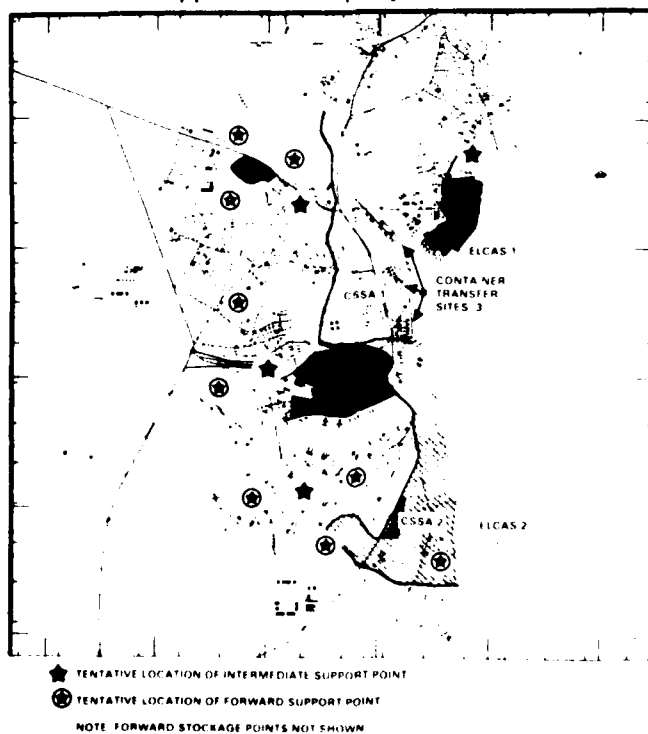


Figure S-1. Tentative Locations of CSS Activities for Mission 6  
 S-15

### 3. Mid-Range Influence

Defensive combat in an urban environment will be enhanced during the mid-range by the introduction of new armored vehicles, motor transport, aviation assets, and man-portable weapons. Since all urban defensive concepts involve mechanized operations outside the actual urban area, each of the anticipated equipment introductions will enhance the capability of VII MAF to defend SYN City. Combat service support requirements are expected to increase with the introduction of these equipment items. A quantified impact statement is not possible at this time until the full logistic impact of each and every mid-range system has been analyzed.

The introduction of the light armored vehicle (LAV) coupled with the lift capability anticipated with the CH-53E helicopter will enable the MAF commander to lift a light armored force into an objective area to conduct armored and artillery raids against exposed enemy flanks, CSS elements, or other vital activities. This capability is most applicable to defensive operations conducted outside the city as in Mission 11 (Defense Outside the City) or the initial stages of defensive missions within the city. The heavy-lift helicopter will also enable the MAF to utilize a sea-based logistics system more effectively by providing a degree of responsiveness in speed and lift that cannot now be matched.

The LAV will improve the MAF capability to conduct defensive urban warfare by virtue of its maneuverability and protection against small arms fire and air burst artillery fire. The LAA Battalion will be used to augment mobile reserve/strike forces, provide fire support for dismounted infantry, and attack local penetrations. The LAV is expected to have a swim capability, which would prove useful during the SYN City defense. The assault gun variant of the LAV will provide direct fire support to infantry troops, although the basic armament is not specifically designed for urban warfare.

From a tactical viewpoint, the introduction of the Shoulder Launched Multi-Purpose Assault Weapon (SMAW), the MK 19 40mm grenade launcher, and the Squad Automatic Weapon (SAW) will substantially increase the firepower available to the infantry battalion. The SMAW may prove to be especially useful in the urban environment.

Logistic operations during the mid-range period will be enhanced by the full implementation of the Amphibious and Field Logistics Systems. Elevated causeways (ELCAS), Crane-on-Deck (COD) nonselfsustaining containership interfaces, improved MHE and motor transport equipment, and other ALS elements will permit a greater amount of cargo to be handled with fewer personnel resources. These items or systems will provide greater flexibility for interfacing with bare beaches, damaged port facilities, as well as undamaged facilities. The LCAC will provide an over-the-horizon launch capability and permit both tactical and logistic innovations.

#### 4. Combat Service Support Functions

Each of the 24 CSS functions, as given in FMFM 4-1 (Draft) dated February 1980, were analyzed to determine when and to what extent that function relates to defensive combat in an urban environment. Levels of effort required to provide CSS in such an environment were analyzed within the limitations imposed by the scope of this contract. The effort required was then compared with the organic MAF capability in each functional area. Conclusions and recommendations relate primarily to the influence of defensive urban combat; existing deficiencies in the MAF CSS capability have been identified with respect to problems that would also result during the defense of an urban area.

The figure opposite provides a graphic summary of the relationship between the CSS functions and defensive operations in an urban environment. The impact of an urban defense upon combat service support ranges from no appreciable impact to major impact. Several of the CSS functions are not performed during the defense envisioned in SYN City. Capabilities to perform other CSS functions, even in a conventional environment, are deficient and will require augmentation, new equipment, or new operational concepts. Conclusions and recommendations regarding each CSS function are provided in the next several pages. Additional information can be found in Chapter V--Combat Service Support Functions and Requirements.

<u>MAJOR IMPACT</u>	<u>MODERATE IMPACT</u>	<u>LOW IMPACT</u>
CIVIL AFFAIRS	SUPPLY	FINANCIAL MANAGEMENT
ENGINEER	TRANSPORTATION	AUTO DATA PROCESSING
MILITARY POLICE	COMMUNICATIONS	FOOD SERVICE
	MAINTENANCE	POSTAL
	GRAVES REGISTRATION	ADMINISTRATION
	CSS TRAINING	ECCLESIASTICAL SERVICES
	LEGAL	DENTAL SUPPORT
		EMBARKATION
		LANDING SUPPORT
<u>NOT PROVIDED</u>		<u>OTHER*</u>
EXCHANGE SERVICES		MATERIALS HANDLING
SPECIAL SERVICE CLUBS		MEDICAL SUPPORT
BAND (PRIMARY MSN)		
PASSENGER & FREIGHT		
TRANSPORTATION		
* PROBLEM AREAS NOT MOBA-UNIQUE		

Figure S-2. Urban Impact Upon CSS Functions (Defense)

### Civil Affairs

- Defensive military operations in urban areas are likely to generate extensive logistic and control requirements in direct support of the populace; these requirements must be met to prevent civilian interference with tactical and logistic operations.
- The organic civil affairs capability in the Marine Corps is not adequate to support MAF defensive operations in a hostile urban environment; augmentation is essential.
- Analysis of the situation in SYN City disclosed that of the 20 CA functions, 14 were of key importance to successful accomplishment of the MAF defensive mission and had to be provided for.
- CA functional areas in which the Marine Corps does not normally require or maintain trained personnel, but which are important in urban warfare, should be the basis for levying USMC requirements on the USMCR and US Army for USAR support.
- The presence of an unusually violent and aggressive populace may create civil affairs problems of such magnitude that a MAF could not successfully defend a large urban area (defensive missions wholly contained within the city). In this situation, a more viable option would be to defend outside the city while retaining control of the port area for cargo throughput and essential CSS interface. This option would significantly reduce security requirements and the level of MP augmentation.

### Engineer

- Engineer CSS requirements peaked during the SYN City offense when engineer elements were tasked to rehabilitate Airfield 1, the port complex, and begin construction in an EAF at Airfield 2. NCR augmentation was recommended to accomplish these tasks.
- Engineer CSS requirements during the SYN City Defense (D+11 through D+40) consist largely of preparing urban structures for the storage of supplies. No extensive horizontal or vertical construction tasks are anticipated. Electrical utilities support is expected to require the same overall level of engineer support as in a conventional environment, while potable water requirements will increase due to the presence of a large civilian population. (It should be assumed that the Aggressor will deny all major utilities.)
- Although engineer CSS requirements during sustained defensive operations are well within the capabilities of engineer units organic to the MAF (less NCR augmentation), combat support engineering requirements during defensive operations will require as many combat engineers as can be provided. It is therefore recommended that the NCR be tasked to assist with the defensive preparations until such time as GOP forces are compelled to withdraw inside the FEBA.

### Military Police

- Additional MP requirements due to the SYN City infrastructure include supervision or control of indigenous police personnel and assets, civilian evacuation, crowd control, and control of detention facilities and evacuee assembly areas.
- The level of MP augmentation depends in part on the attitude of the indigenous populace. This specific information is not provided in the SYN City data base.
- It is recommended that at least two additional MP Guard Companies be embarked in the AFOE prepared for early debarkation. This force multiplier will allow combat units to devote their full attention to achieving designated combat objectives.

### Supply

- The uniqueness of the urban environment is such that the development of MOBA PWRMS Project Stock should be considered. Items in this project stock would include selected Class II, IV, V, and VII items.
- Normal supply procedures and policies are adequate to provide support to VII MAF.
- Storage of supplies, especially Class V, requires large land areas and the use of selected buildings for covered storage. These areas are available once the city has been consolidated and Class V stocks are stored by the modular storage concept. City structures will provide unique opportunities for supply storage.



- The impact of containerization is far more wide-reaching than that imposed by the defense of an urban area.
- A minimum of 20 DOS of all supply classes should be stocked in the FBH to support defensive operations. These stocks should be dispersed at CSSAs, ISPs, and other forward areas consistent with the class of supply and unit requirements for those supply items.
- Engineer support may be required to prepare urban structures for supply storage. This support should be requested as early as possible due to competing demands for engineer assets.

#### Maintenance

- Like any other defensive operation, a greater reliance will be placed on forward contact teams.
- The SYN City area is expected to provide numerous maintenance facilities that would be useful to accomplish maintenance functions.
- Current maintenance procedures and capabilities are judged to be adequate in an urban environment.

### Transportation

- Transportation requirements prior to embarkation and during the transoceanic deployment are not significantly affected by the existence of an urban objective.
- Transport resources must be compatible with containerized supplies--current equipment is not optimized for transport of large quantities of containers.
- Current transport vehicles are judged to be capable of operating within an urban environment. No new items of equipment are necessary to provide transport support in such an environment, although container-compatible trailers should be evaluated in the urban context.
- The increased vulnerability (and fixed level of assets) of MT vehicles in the SYN City area warrants additional hardening to protect personnel and cargo. Lightweight, easy-to-apply armor for critical areas should be procured and made available for deployment.

### Communications

- Numerous studies have noted that communications will be degraded in an urban environment. SYN City is no exception.
- The indigenous communication system, including radio and television, will be used only to accomplish civil affairs liaison between VII MAF and the SYN City populace. VII MAF elements will use organic communication gear to accomplish their respective missions.
- Pending the introduction of more capable communications equipment, ad hoc measures will be undertaken to maintain communications in areas of degradation, with considerable reliance on wire.

#### Graves Registration

- Criteria for temporary interment, as suggested in ECP 1-1, cannot be met in most (if not all) areas of SYN City.
- Psychological factors and public opinion press for the evacuation of all KIA back to CONUS.
- KIA during Operation BREAKER will be processed by the Graves Registration Platoon and evacuated to theater support facilities by AE shipping or fixed-wing aircraft once Airfield 1 is operational.
- The use of refrigerated containers to hold KIA would provide a storage buffer alleviating the need for temporary interment should the retrograde operation be delayed. These containers should be embarked in the Assault Echelon.
- The present Graves Registration (GR) Platoon structure is judged incapable of handling surge requirements. In accordance with the Medical/Dental Support Systems study it is recommended that:
  - A dental technician billet be added to the platoon headquarters.
  - One shore party billet in each GR section be changed to a GR registration specialist billet.

### CSS Training

- Selected combat service support elements will require additional training to properly interface with facilities anticipated in any urban environment. (Deficiency areas are noted in Figure V-20 appearing on page V-102 of this Volume.)
- This training should be initiated by Mobile Training Team visits to CSS units followed by unit Professional Development Seminars. Identified training topics may be addressed by practical exercises (PE), command post exercises (CPX), and additional blocks of instruction at MOS-producing schools.
- Deficiencies in CSS training are not of such magnitude as to jeopardize accomplishment of the MAF mission. Combat and combat support training deficiencies, while not specifically enumerated within this study, are judged to be more crucial than CSS deficiencies.

### Legal

- An increase in the legal workload is expected during the defense of an urban area. The level of military crime will increase as well as civil claims against the US government.
- Additional legal teams will be staged at the theater air base and deployed into the FBH on or about D+10 should the combined MAF and CAG capability prove to be inadequate. In long-term operations up to 35 legal augmentation personnel were calculated to be needed. For short-term operations (30-60 days) the assets available to the Staff Judge Advocate and Civil Affairs Group Detachments are judged to be adequate.

### Materials Handling

- Current materials handling resources are marginally adequate to handle the MHE requirements resulting from containerized resupply operations.
- Fielded USMC MHE assets are not optimally compatible with containerized cargo in the AFOE or resupply echelons. Procurement of container-compatible container handlers and water transport trailers will be necessary to land and distribute cargo.
- The Amphibious Logistic System (ALS) with ELCASs and TCDFs (or CODs) will interface with urban port facilities. Selected subsystems must be embarked in the AE so that they are operational by the D+5 arrival of the AFOE.
- The MOBA environment is not significant factor with respect to MHE. Containerization influences are far more significant.

### Medical

- A moderate level of casualties will exceed the medical capability ashore (in terms of bed availability) once assault shipping and Casualty Receiving and Treatment Ships (CRTSs) redeploy outside the SYN City area.
- Additional definitive treatment facilities with 1,800-bed capacity must be on station by D+10.
- Indigenous medical facilities, already at 85 percent utilization, will be fully required to handle additional civilian casualties.
- This deficiency in available medical support is not MOBA-unique. A moderate level of casualties in any combat environment will exceed the available bed capacity once selected AE shipping leaves the AOA.

#### CSS Functions with LOW MOBA Impact

- The CSS functions of Financial Management, Automated Data Processing, Food Service, Postal, Administration, Ecclesiastical Services, Landing Support, Embarkation, and Dental Support are not significantly affected by defensive operations in a urbanized environment.
- These functions will continue to be performed in the same manner as in any other defensive operation. Personnel should be provided with basic indoctrination concerning urban combat.

#### CSS Functions Not Provided During SYN City Defense

- Exchange Services, Special Service Clubs, Band (performing primary mission) and Passenger and Freight Transportation will not be provided during the amphibious assault of SYN City.
- These functions would not normally be provided during the initial stages of any intense defensive situation.

AUGMENT USMC CIVIL AFFAIRS CAPABILITIES - EMBARK SELECTED ELEMENTS WITH AE

EMBARK NCR IN AFOE TO COMPENSATE FOR PROJECTED ENGINEERING SHORTFALL,  
REDEPLOY PRIOR TO INNER-CITY DEFENSIVE PHASE

EMBARK MINIMUM OF TWO ADDITIONAL MP GUARD COMPANIES

ESTABLISH URBAN WARFARE PWRMS

CONDUCT URBAN WARFARE CSS TRAINING

PROCURE CONTAINER-COMPATIBLE MHE AND TRANSPORT RESOURCES

PROVIDE 1,800 BED DEFINITIVE CARE FACILITY IN AOA BY D+10

Figure S-3. Principal Combat Service Support Recommendations

## 5. Indigenous Resources

Urban areas have the potential for providing key resources or facilities that may be used to enhance the military capability of the landing force and sustain the indigenous populace. Preliminary analyses must be reevaluated once the MAF has landed and subordinate units have had the opportunity to conduct ground reconnaissance to supplement any information provided by in-country agents and photointerpretation teams. The object of the total reconnaissance effort is to provide a quantitative and qualitative analysis of all available resources.

While all of the resources are important to the Landing Force mission, the availability of selected areas, facilities, and supplies are vital. These key resources and their intended uses include:

- Fields, Surfaced Areas - Supply storage, maintenance
- Woods - Tactical billeting, supply storage
- Port - Focal point for cargo throughput
- Prison - Primary detention facility for POWs and civilian internees
- Airfields - Basing for high-performance aircraft, emergency resupply, medevac
- Schools - Primary relocation sites for evacuees
- Public Buildings - Major CPs, storage, sanitary facilities
- Private Dwellings - Billeting, minor CPs
- Bridges - Intact capture vital to conserve limited bridging assets



- Roads - Class V storage (tertiary roads), MSRs
- Construction Supplies - Airfield, road, and port rehabilitation
- Key Municipal Workers - Civil/Military interface and operation of utilities

RESOURCE	RESOURCE UTILIZATION														MANAGEMENT BY VII MAF		
	MILITARY REQUIREMENT								CIVIL REQMT								
	MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL COMMUNICATIONS	SUPPLY	MAINTENANCE	PUBLIC SAFETY	PUBLIC HEALTH	PUBLIC INFORMATION	NO IDENTIFIED REQMT	CA MANAGEMENT	GCE MANAGEMENT	ACE MANAGEMENT	CSSE MANAGEMENT		
NATURAL	1.2, 4.6, 8	3.6, 7.8	3	3.6 8		2.3, 4.8	4	6.8	1.5, 6.8			1	2.3, 6.7		4		
FACILITIES	3.6			5		1.3	4.5	2						6	1.2 3.4 5		
STRUCTURES			**		1.3, 5.6	1.4	1	2.3	4.7	3	8	ALL					
UTILITIES AND COMMUNICATIONS				1.2, 3.4	5.6, 7.8			1.5	1.2, 3.4	7.8		ALL					
LOCs	ALL														1.2 3		
EQUIPMENT	2.4	4	5	4		1.2	3	5	2			5		3	1.2 4		
SUPPLIES	1.3	1	1	1		1.3			2.4			2.4			1.3		
HUMAN				2	1.3			3.4	2	1.5		ALL					

SPECIFIC  
UTILIZATION  
IN VOLUNTARY

SPECIFIC EXAMPLES OF UTILIZATION PROVIDED IN VOLUME I CHAPTER VI

\*GENERAL MANAGEMENT RESPONSIBILITY NOTED SHOULD BE REEVALUATED ON A CASE BY CASE BASIS ONCE ASSAULT UNITS HAVE LANDED

\*\*AS REQUIRED STRUCTURE TYPES WILL VARY

NATURAL	1. Farms 2. Fields 3. Woods 4. Surfaced Areas 5. Interment sites 6. Lakes (Ponds) 7. Swamps 8. Rivers	EQUIPMENT	1. MHE 2. Motor Transport 3. GSE (Aviation) 4. Engineer 5. Public Safety	STRUCTURES	1. Warehouses 2. Schools 3. Police & Fire Stations 4. Stores/Shopping Centers 5. Private Dwellings 6. Hotels/Apartments 7. Medical 8. Churches & Museums
FACILITIES	1. Port 2. Prison 3. Bulk Fuel Complex 4. Naval Station 5. Industrial Areas 6. Airfields	SUPPLIES	1. Construction 2. Subsistence 3. Fuel 4. Medical	UTILITIES & COMMUNICATIONS	1. Water Treatment 2. Electric Power 3. Waste Treatment 4. Sanitary Disposal 5. Police & Fire Comm. 6. Telephones 7. Radio & Television 8. Newspapers
LOCs	1. Roads 2. Bridges 3. Railroads	HUMAN	1. Civil Government 2. Utility 3. Public Safety 4. Equipment Operators 5. General Populace		

Figure S-4. VII MAF Utilization of Indigenous Resources

Defensive combat wholly contained within an urban area may generate competing demands for available indigenous resources. Land areas and structures may be desired for a combination of tactical and logistic uses. Resource utilization priorities must be established in major operational areas consistent with the primary purpose of each area. Of particular importance to VII MAF are those indigenous resources located in the Forward Defense Area and tentative locations for CSS activities within the city.

Resource utilization priorities in the Forward Defense Area (FDA) focus on the enhancement of 7th MarDiv countermobility and survivability efforts. Land and structures on the forward edge of the FEBA will be used almost exclusively for implementation of the inner barrier plan; no CSS will be accomplished in this slice of the FDA. Towards the rear of the FDA more CSS functions will be accomplished and indigenous resources will be used for both tactical and logistic uses. The situation is substantially different in urban sectors used primarily for combat service support purposes. These areas are not normally located in the FDA and countermobility/survivability demands for land and structures are not as extensive.

The figure opposite provides general priorities for the assignment of indigenous resources for tactical, CSS, and civil support purposes. This tentative guidance should be applied on a case-by-case basis in actual urban defensive combat. Unit commanders at all levels should be aware of the possible uses and assignment priorities of each of the indigenous resources likely to be found in their sectors of responsibility.

RESOURCE CATEGORY TYPE		COMBAT SERVICE SUPPORT AREA RESOURCE UTILIZATION PRIORITY AS APPLIED TO MILITARY REQUIREMENT										FORWARD DEFENSE AREAS RESOURCE UTILIZATION PRIORITY AS APPLIED TO MILITARY REQUIREMENT										ALL INDIGENE EVACUATED FROM FORWARD DEFENSE AREA			
		MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL AND COMMUNICATIONS	SUPPLY	MAINTENANCE	AVIATION OPERATIONS	VEHICLE PARKING	POW/C COMBATANT	CIVIL SUPPORT	MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL AND COMMUNICATIONS	SUPPLY	MAINTENANCE	AVIATION OPERATIONS	VEHICLE PARKING		POW/C COMBATANT	CIVIL SUPPORT	
LAND	OPEN	4	4				2	3	1	3			2	1	2	-	-	3	3	1	4				
	VEGETATED		2					1		1				2	1	2	-	-	3	3		4			
	HARD SURFACE	4	3				2	1	1	3			2	1	2	-	-	3	3	1	4				
WATER	RIVERS	3	1		2							4	3	1		2									
	STREAMS				1							2				1									
FACILITIES	PORT DOCKS						1	2				3	THESE FACILITIES ARE NOT LOCATED IN THE FORWARD DEFENSE AREAS WITHIN SYN CITY												
	PRISON										1	1													
	BULK FUEL COMPLEX	3					1					2													
	NAVAL STATION																								
	INDUSTRIAL AREAS	THESE FACILITIES ARE NOT LOCATED IN DESIGNATED CSS AREAS WITHIN THE SYN CITY																							
	AIRFIELDS																								
STRUCTURES	SHOPPING CENTERS						1	2			3	4	1	2	3	-	-	-							
	SCHOOLS																								
	MUNICIPAL						1	2	3																
	PRIVATE DWELLINGS						1																3		
	HOTELS APARTMENTS			3			1	2																	
	MEDICAL			1								2													
UTILITIES	ALL				1							2													
COMMUNICATIONS	ALL					1						2													
LOCs	ROADS	1					4	3	2	5			1					3	3	2	4				
	BRIDGES	1	2										1	2											
	RAILROADS						1											1							
EQUIPMENT	MHE MT						1					2	EVACUATED TO CSS AND OTHER AREAS												
	ENGINEER			1	2			3				4													
	PUBLIC SAFETY						1					2	EVACUATED FROM FORWARD DEFENSE AREA												
CONSTRUCTION			1	1	2						3														
OTHER											1	1	1	2											
HUMAN ALL		ALL INDIGENE EVACUATED											ALL INDIGENE EVACUATED												

NOTE 1 PRIORITIES ARE KEYED AND UNIQUE TO EACH RESOURCE ITEM.  
CROSS COMPARISONS ARE NOT VALID

2 ADDITIONAL INFORMATION CONCERNING THE UTILIZATION OF RESOURCE  
TYPES CAN BE FOUND IN VOLUME I, CHAPTER VI

NOTE 1 PRIORITIES ARE KEYED AND UNIQUE TO EACH RESOURCE ITEM.  
CROSS COMPARISONS ARE NOT VALID  
2 ADDITIONAL INFORMATION CONCERNING THE UTILIZATION OF RESOURCE  
TYPES CAN BE FOUND IN VOLUME I, CHAPTER VI

Figure S-5. Resource Utilization Priorities in Forward Defense and CSS Areas

#### 6. Logistic Planning Factors and Usage Rates

Planning factors for each class of supply were reviewed to ascertain their validity during the defense of an urban area. The threat within SYN City consisted of MRB remnants left from the offense, partisan groups, and other Aggressor elements covertly inserted into the city. An Aggressor Combined Arms Army comprised the threat outside the city. Planning factors developed for Operation BREAKER SIX therefore include aspects of the urban as well as conventional combat environments. Since many of the supplies required to support this type of combat operation could be preloaded, prepositioned and/or preconfigured, the principal task was to determine if existing planning factors, governing this prepositioning of supplies, differed appreciably from planning estimates generated from the peculiar requirements of Operation BREAKER SIX. Significant differences affecting the accomplishment of the MAF mission were highlighted and are noted on pages following as well as in Chapter VII of this volume.

Class I - The current planning factor of 7.05 lb/man/day overstates the actual requirement by 50%. This difference is due to the ration mix during the early stages of the defense (D+11 to D+40) versus a long-term (180-day) mix. No remedial action is recommended.

Class II - The utilization of selected secondary equipment items will be greatly influenced by the nature of the combat environment. An urban area favors the use of individual weapons, engineering tools, and miscellaneous industrial supplies. Body armor and chemical protective clothing will enhance the survivability of friendly forces. Urban Combat Active Replacement Factors (CARFs) have been provided in Chapter VII for those Class II items whose usage is expected to differ markedly from a more conventional usage represented by USMC CARFs in NAVMC 1017.

Class III - Analysts concluded, based on the development of an alternate computational methodology for ground fuel use, that ground fuel requirements during the SYN City defense were 56% (MOGAS) and 66% (DIESEL) of corresponding quantities based on planning factors contained in NAVMC 1017. The TAM methodology was found to overstate fuel requirements for elements within the city and understate fuel consumption by mechanized forces operating outside the urban area. Aviation fuel requirements were judged to be at a "normal" level due to the heavy use of fixed-wing assets outside the city. The bottom line is that normal planning factors for this supply class will be adequate in an urban environment and will provide a cushion, or safety factor.

Class IV - Requirements for Class IV items to support defensive operations in SYN City were estimated to be significantly lower than those calculated during the offensive analysis due to the fact that many items used to support offensive operations are still available and will be used again during the defense of SYN City. Landing mat, culvert, lumber, and steel stock can be reused while additional quantities of burlap bags, barbed wire and tape, fence posts, and wire rope are required to install obstacles and harden defensive positions. Local materials will be used when available. Initial Class IV estimates would be refined once additional information became available concerning the terrain outside the city and building densities and types within the city.

Class V - Ammunition expenditures during the overall urban defense include those items expended by GOP forces conducting MCATF operations in conventional terrain outside SYN City as well as Class V items expended within the city. Conventional planning factors applicable to MCATF operations are valid for the duration of MCATF operations; VII MAF (-) units remaining within the city are expected to require 60% of the average daily ammunition expended during assault operations. Once GOP MCATFs have withdrawn inside the city and VII MAF is occupying and defending strongpoint positions in the FDA, the Class V planning factors are highly dependent on the Aggressor scheme of maneuver, locations of major penetration points, and specific terrain/structures utilized during the hasty defense. The development of defensive mini-scenarios modeling the MAF urban defense against a multi-divisional threat proved to be cost-ineffective, forcing the selection of an

alternate methodology. Analysis used the Delphi technique to establish factors to be applied to established Class V planning factors contained in Chapter 7 (Table 7-6) of FM 101-10-1 w/Ch 1 (February 1978). These factors are shown in Table VII-6 appearing on page VII-27 of this volume.

Class VI - Personal demand items will be furnished by the Ration Supplement Sundries Pack, or equivalent, until AAFES support is available. Once this support does become available, the overall lb/man/day planning factor is not significantly different in an urban environment as opposed to a nonurban temperate environment.

Class VII - Selected major end items will find heavy use during the defense of SYN City while other items, such as air conditioners and refrigerators, will not be required in the densities organic to MAF units. Each item must be evaluated in the light of combat requirements for that item during an urban defense. Analysts have used a Delphi technique to provide Urban (Defense) CARFs for selected items whose utilization patterns differed in this environment.

Class VIII - The normal mount-out of medical supplies and equipment is judged adequate to provide treatment for the moderate level of military casualties anticipated during the first 52 days of the overall operation (D-day through D+51). No restructuring of AMAL/ADAL blocks appears warranted for operations in an urban environment. Indigenous medical supplies will be used to treat civilian casualties; additional drugs and equipment may be required to ensure that civilian medical requirements can be met during long-term operations. These

are provided for in Annex G (Civil Affairs) to Oplan 1-81 contained in Volume II of this report.

Class IX - Overall requirements for repair parts during Operation BREAKER SIX should be at a relatively normal level after considering the influences of both open and urban environments. Unit commanders have the ultimate responsibility to ensure that adequate repair parts stocks have been identified, procured, and embarked.

Class X - The tactical isolation of SYN City from external resupply necessitates the provision of subsistence-level foodstuffs following the exhaustion of indigenous supplies, estimated to occur on or about D+10. Providing a 1500 calorie subsistence level diet for 250,000 indigenous civilians was calculated to require 128 short tons of food per day, or approximately 1 lb/man/day. Emergency medical kits, detailed in Volume II, Annex G, Appendix 3, are also recommended for staging at the theater support facility in the event that indigenous Class VIII stocks are prematurely depleted. Long-term (>30 days) defensive operations may also necessitate providing other essentials such as personal hygiene products and sundries. These items were not included in the defensive total as local stocks should be initially sufficient with proper rationing policies.



CHAPTER I  
INTRODUCTION

## Introduction

### SYNTHETIC (SYN) CITY

SYN CITY, A FICTITIOUS METROPOLITAN PORT CITY, AND ITS ASSOCIATED DATA BASE ARE THE BASIS FOR THIS ANALYSIS OF GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS.

The SYN City map and associated Technological Data Base were prepared for the Naval Civil Engineering Laboratory, Port Hueneme, California to serve as the basis of this analysis of General Urban Warfare Amphibious Logistics Applications, and possible further studies in this field. It is a synthetic representation of an urban area on a seacoast. A data base was established for six separate city locales and a statistical synthesis of all the data on these urban areas was consolidated into a single fictitious metropolitan development. These locales are:

Casablanca, Morocco	Canton, China
Charleston, South Carolina, USA	Bremerhaven, Germany
Leningrad, USSR	Belem, Brazil

The map product is shown reduced on the facing page.

The data base is a synthesis of technical information representing the following:

- Open Space: Slopes, surfaces and vegetation.
- Environment: Temperatures, precipitation and wind on a quarterly and annual basis.
- Utilities and Communications: Garbage, sewage, water, electricity, telephones, radio/television.
- Transportation: Geomorphology, terrain characteristics, surface and subsurface networks, water routes, bridges, tides, port facilities, rail routes and air facilities.
- Medical: Hospitals, blood services, and medical hazards.
- Resources: Local transportation (buses, trucks), construction, industry, foods, fuels, public buildings, warehouses, population.

The SYN City data base is represented in two ways:

- A cartographic presentation to 1:20,000 scale with 1,000-meter universal transverse mercator grid network.
- A statistical and graphic presentation of the same data as a numerical technical data base.

Additional information concerning the purpose of this analysis and general information about the SYN City area can be found in Volume I, (BDM/W-81-316-TR) of this study effort.

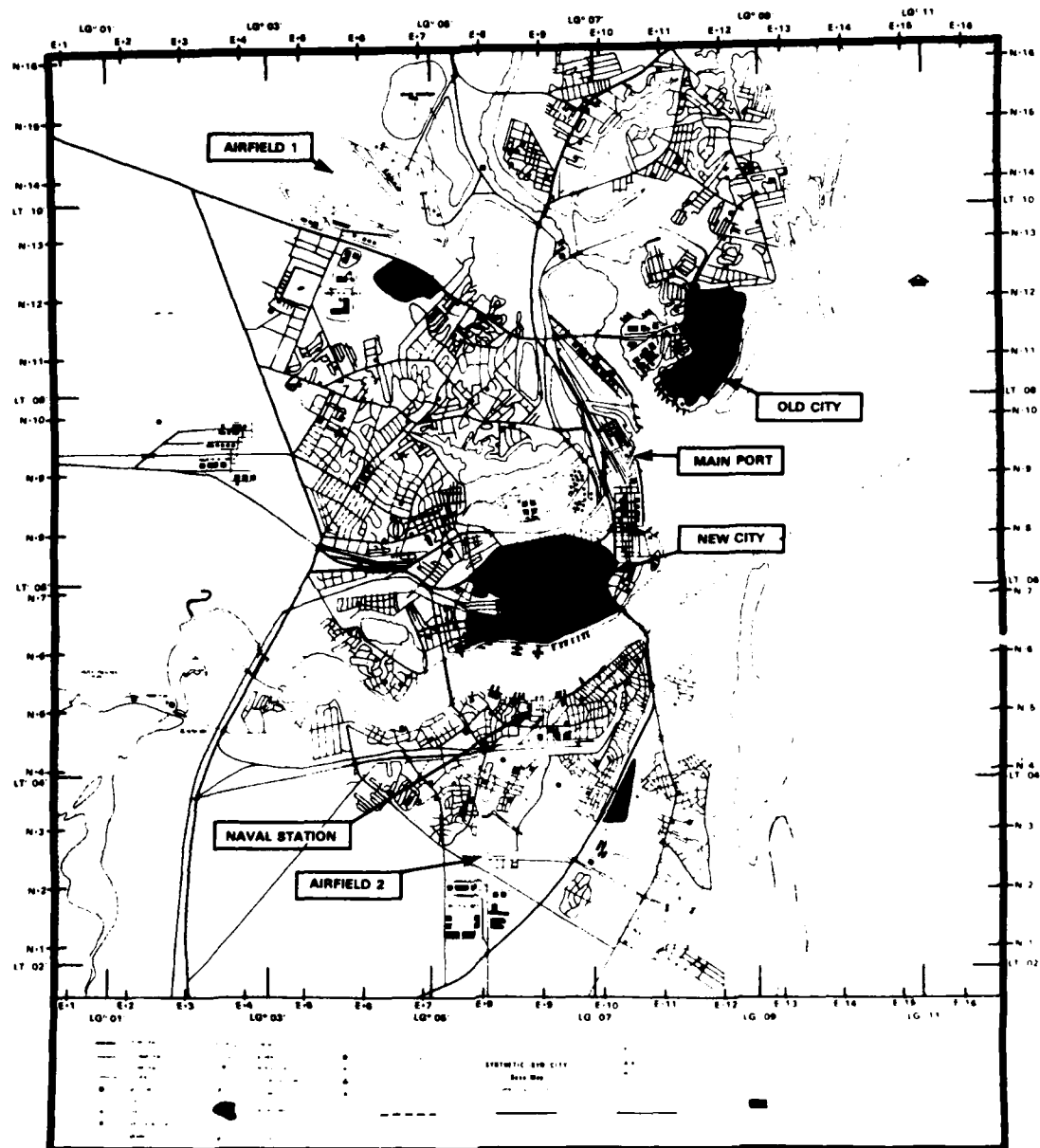


Figure I-1. The Synthetic (SYN) City Map Product

CHAPTER II  
URBAN WARFARE

## Urban Warfare

### INTRODUCTION

THE INEVITABILITY OF DEFENSIVE OPERATIONS IN AN URBAN AREA REQUIRES THAT MILITARY PLANNERS UNDERSTAND THE PECULIARITIES OF URBANIZED TERRAIN AND THE MANNER IN WHICH THREAT FORCES ELECT TO ATTACK SUCH AREAS.

Chapter II of Volume I of this study effort noted some of the military aspects of different functional areas which may be contained within an urban complex. That discussion, while also relevant in a defensive situation, will not be repeated herein but is referenced in the facing figure and summarized in paragraphs which follow. The remainder of this chapter will deal with Threat doctrine, as published in open literature, concerning the attack of an urban area and the employment of specialized units to achieve tactical objectives. The primary reference for that discussion is "Combat Action of a Motorized Rifle Battalion in a City", written by MG Shovkolovich et al. and published in Moscow in 1971.

Street patterns and building construction exert a significant influence upon the establishment of the defense and the employment of particular weapons and weapon systems. Building locations and masking effects complicate the placement of indirect fires. Vehicular movement may be severely restricted by the buildings themselves or obstacles sited in conjunction with the buildings. Streets provide killing zones as well as opportunities for rapid movement. Subterranean passageways provide movement possibilities which are covered and concealed from above-ground observers.

Although an urban complex may provide advantages for the attacker as well as the defender, it is the defender who has accrued the greatest advantage as shown by recent urban battles. The defender usually has the opportunity to become familiar with the urban infrastructure and prepare defensive positions along likely avenues of approach. Force ratios on the order of 10:1 are generally accepted as being required to successfully attack a well-defended urban complex.

<u>SUBJECT</u>	<u>VOLUME I REFERENCE</u>
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CITY PATTERNS	II-6
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CLOSED, ORDERLY BLOCKS	II-10
DISPERSED RESIDENTIAL AREA	II-12
HIGH-RISE AREA	II-14
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FUNCTION FORCE \ TYPES	DENSE RANDOM A	CLOSED ORDERLY B	DISPERSED RESIDENTIAL C	DISPERSED HIGH RISE D	INDUSTRIAL TRANSPORTATION E
DEFENSE					
INFANTRY					
ARMOR					
OFFENSE					
INFANTRY					
ARMOR					

LEGEND:

	FAVORABLE
	PARTIALLY FAVORABLE
	PARTIALLY UNFAVORABLE
	UNFAVORABLE

Figure II-1. Influence of City and Building Patterns Upon Urban Combat

## Urban Warfare

### THREAT DOCTRINE IN URBAN OFFENSIVE OPERATIONS

CITIES PLAY AN IMPORTANT ROLE IN THE ECONOMIC AND POLITICAL LIFE OF A COUNTRY. CONSEQUENTLY, CITIES WILL HAVE GREAT MILITARY IMPORTANCE IN ANY FUTURE WAR THE IMPERIALIST MIGHT UNLEASH. (MG Shovkolovich et al., "Combat Action of a Motorized Rifle Battalion in a City.")

Based on the experience of past conflicts, Threat military planners contend that many battles in future wars will be fought in cities, towns, and built-up strip areas. These areas derive military value by virtue of their political, economic, or industrial importance as well as their value as large scale obstacles to rapid mechanized movement. The desire to maintain attack momentum impels Threat forces to avoid city combat whenever possible; however, the inevitability of such combat has been recognized at the highest command levels and military planners have analyzed the conduct of previous actions to refine small unit tactics and CSS concepts in the light of modern combat capabilities.

Previous urban combat has shown that there are some significant differences between combat in cities and combat in more open terrain. The compartmentalization provided by streets and structures forces the battle to be waged by small, semi-independent groups with appropriate support slices. Command and control of such small units becomes more difficult once within the city due to line-of-sight restrictions and communications degradation. A rapid rate of advance is not always possible to maintain and logistic support becomes more complicated. Many Threat weapons systems, ideal for combat in the open, are not suited for use within built-up areas or urban complexes. The difficulty of observation in the city makes the massing of combat power at the decisive time and place more difficult. Reconnaissance, vital for the successful accomplishment of any mission, is greatly restricted and more hazardous when defending units are well-concealed in buildings and other urban facilities. These differences are not of such magnitude as to jeopardize the Threat offensive mission, but they will cause the urban battle to be more costly, force ad hoc groupments to achieve specialized objectives, and slow the overall rate of advance. It should be noted that these same considerations would apply to friendly forces conducting a similar urban assault.

The particular method by which Threat forces elect to attack a city is determined principally by the military, political, economic, and administrative importance of the city as well as the attitude of the inhabitants towards the attacking force. Other considerations include:

- Location, nature, and layout of the city.
- Composition and intentions of the defending force.
- Terrain within and without the city.
- Meteorological conditions based on day and time of year.
- Ethnological composition and disposition of the inhabiting population.

Options for the attack and seizure of a city include attack from the march (or attack following envelopment of the city) and attack from a position of direct contact with the defending force. The preferred option is to attack from the march deep into the defenders' positions bypassing pockets of resistance on intermediate defensive positions. Separate task forces attempt to flank the defenders' main defenses and occupy positions between the defending force and the city thereby denying the defender the use of the city. These advance detachments enter the city, seize key lines of communication, and await the arrival of the main body. The advance detachment mission can be accomplished by vertical assault and/or ground assault units heavily reinforced and capable of establishing a strong defense. Should this attack from the march prove successful, the attacking elements pursue the defending force, block withdrawal routes, and attack in depth.

If the attack from the march fails, then advance units seize and block key approaches to the city. Simultaneous attacks are launched on the flanks and rear after lengthy preparatory fires have softened defenders' positions and destroyed key logistic and command centers. This method of attack is preferable if the city is stubbornly defended.

Nuclear weapons have a greater possibility of use when the city is to be attacked from the march and decisive damage must be inflicted on the enemy in a short period of time with the least expenditure of attacking force strength. Following the initial destruction of defending units and positions, the attacking units exploit the damage and confusion caused by the strike, attack deep within the defensive zone, and seize the city. These strikes will achieve the greatest desired effect if delivered against the edge of the metropolitan area where the defender has deployed the bulk of his combat strength or against reserve forces deep within the city. Threat planners are well aware that nuclear strikes create significant barriers of rubble and fires which may accrue to the defenders' advantage and force the attacker to detour around these blocked or contaminated areas. The decision to employ weapons of mass destruction is made by the senior commander who must weigh the military benefit of such use with the level of civilian casualties and destruction of vital areas of the city.

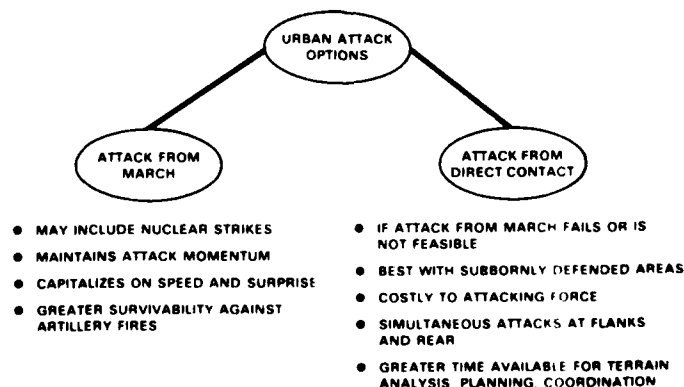


Figure II-2. Principal Aggressor Attack Options



## Urban Warfare

### THREAT MOTORIZED RIFLE BATTALION IN URBAN OFFENSIVE COMBAT

THE ROLE A BATTALION PLAYS IN AN ATTACK IS DETERMINED BY THE COMBAT MISSION IT IS CARRYING OUT AND ITS PLACE IN THE COMBAT FORMATION OF THE REGIMENT. (MG Shovkolovich et al.)

The motorized rifle battalion generally operates as a subunit of the motorized rifle regiment, although it may be tasked to perform independent missions with the attachment of supporting arms elements as appropriate to the situation. In the context of an attack to seize a large city, the MRB is a versatile base organization which may be tasked to play a number of different roles including those of advance guard, assault in either the first or second echelons on primary or secondary avenues of approach, tactical air landing force, and assault detachment. The mission and support requirements of the baseline MRB differ in each of these offensive roles.

The more common, and probably most difficult, mission that the MRB may be tasked to accomplish is that of a battalion in the first echelon assaulting on a primary approach route from the march. A battalion in this situation would capitalize on any successes of other task groupments (including artillery, aviation, and the advance guard) to destroy defending units, seize and control key terrain, and maintain the momentum of the attack. The MRB would be supported by at least a battalion of artillery, a tank company, and a company of sappers (combat engineers) as well as close air support and divisional fire support. The assigned frontage will obviously vary with the particular street pattern but is generally on the order of 500 meters encompassing several parallel streets.

Another possible mission for the MRB is to attack in the first echelon along a secondary approach route. The emphasis in this mission is to contain the enemy in sector and prevent counterattacks against the main body rather than to break through the enemy defenses and penetrate in depth. An MRB in this situation would be allocated fewer reinforcements and would operate along a broader front than in the first case.

The traditional missions that may be given to the second echelon MRB remain unchanged in urban warfare: reinforcement of the first echelon, repelling counterattacks, replacement of attritted first echelon units, isolation and neutralization of bypassed resistance. During the course of a deliberate attack, a second echelon MRB may be given several different missions and must be prepared for each.

A motorized rifle battalion as the advance guard would attempt to avoid any decisive engagement in the security zone, seize key objectives within the city, and hold these objectives until the arrival of main body forces. Should the defender have weak defenses in that sector, the advance guard MRB may be ordered to exploit its initial success and continue the attack deep into the forward defense area. The keys to success for this

7  
element lie in rapid movement, surprise, shock, and decisive action. MRBs in the advance guard receive attachment of artillery, air defense, N3C, and armor elements as appropriate to their particular mission and the defense strength at the principal objective.

The MRB may be tasked to act as a tactical air landing force and assigned one or more of the following missions: seize key objectives, destroy nuclear and/or air defense weapons, establish blocking positions astride counterattack routes, seize crossing sites, disrupt defense rear areas, and/or coordinate with other advance guard or first echelon elements. The air landing force could be used as an enveloping force to prevent reinforcement or seal withdrawal routes. Mobility is provided by troop transport helicopter or air cushion vehicle as in the case of a coastal area.

The final MRB role which will be addressed herein is that of the MRB as the basic assault team. The assault team is tasked to destroy and penetrate strongpoint defenses and is heavily reinforced with direct fire weapons and sapper personnel. The assault formation is columnar with four movement groups. The composition of these groups follows.

- Infiltration Group - MRC, AT Plt.
- Assault Group - MRC, 1/2 of Bn hvy wpns, 2-3 Btry SP Arty, sappers.
- Support Group - Tk Plt, 1/2 of Bn hvy wpns, 3-4 direct fire guns.
- Security Group - MRC.

The assault team, organized around the MRB, is the basic unit for assaulting stubborn defensive strongpoints as might be found in the deliberate defense of an urban area.

#### POSSIBLE ROLES OF THE MRB IN AN URBAN ASSAULT

- ADVANCE DETACHMENT
- FIRST ECHELON ELEMENT
- SECOND ECHELON ELEMENT
- RESERVE ELEMENT
- ASSAULT TEAM
- TACTICAL AIR LANDING FORCE

## Urban Warfare

### COMBAT SUPPORT FOR THE THREAT MRB IN URBAN OFFENSE

REINFORCEMENT OF A BATTALION OR COMPANY IN AN ATTACK IN A CITY WILL DEPEND IN EACH INDIVIDUAL CASE ON THE COMBAT MISSION BEING CARRIED OUT, THE NATURE OF THE ENEMY'S DEFENSES, THE LAYOUT OF THE CITY, THE STRENGTH OF THE ATTACKING FORCES, AND ALSO THE METHOD USED TO SEIZE THE CITY. (MG Shovkolovich et al.)

Experience in past conflicts has demonstrated that the key to successful offensive actions in urban areas is to structure the reinforcement of the basic MRB so that every MRB is in itself an assault team capable of tactical independence. Combat support elements are attached as low as the squad level to facilitate the seizure of individual strongpoints in the main defensive area.

The reinforcement of an MRB in the first echelon may include up to a reinforced artillery battalion, a tank company or battery of self-propelled artillery, a sapper company, and NBC monitoring and decontamination teams. If the battalion forms the nucleus for an assault team then additional sappers and artillery (direct fire) may be attached. Further, the assault MRB would be allocated additional ammunition, grenades, smoke, signalling devices, and urban building assault gear. Sappers would carry additional breaching demolitions and artillery units would receive a modified unit of fire with a greater percentage of munitions suitable for direct fire against hardened structures or positions.

Motorized rifle battalions in the second echelon receive smaller reinforcement slices appropriate to their respective missions. The reinforcement must be structured so that the MRB may be able to accomplish other missions arising under such short notice that restructuring the reinforcement package is not feasible. The MRB in the advance guard is reinforced with the same basic combat support elements sized in relation to the enemy strength and the advance guard mission. If the advance guard were to assault and seize key objectives within the city then the MRB reinforcement would be similar to that provided to an assault team. Combat support attachments to an MRB employed as a tactical air landing force would be minimal, but its share of divisional long-range artillery fires and close air support would be increased accordingly.

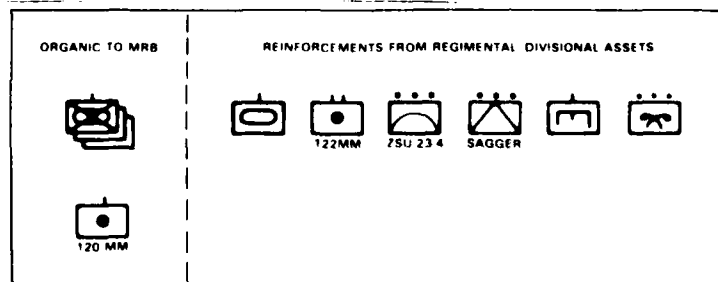


Figure II-3. Typical Reinforcement of an Assault Team MRB

Units or elements reinforcing the MRB must be utilized effectively in the light of their individual and collective abilities to achieve the desired result. The attachments may be effected down to platoon or squad level if the MRB subelement is to be capable of tactical independence, especially in the urban assault situation. The following subparagraphs highlight capabilities and considerations for utilization of each of the support elements that typically reinforce the MRB engaged in an urban offense.

- Tanks: Attached to MR companies and platoons. The tank platoon is normally the lowest subdivision of the tank company although individual tanks may be attached to MR platoons and even squads. The tank platoon wedge, with dismounted infantry following in trace, offers the greatest self-protection for moving down city streets. Missions for tank elements include destruction of strongpoints, destruction of enemy armor, obstacle breaching, and fire suppression.
- Artillery: Within a city, most fire missions are accomplished by direct lay. Attachment of artillery pieces to platoons and companies is fairly common. Artillery elements are included within the combat formations of assault teams and fire by direct lay to destroy defended structures and weapons emplacements. Artillery CPs are co-located with those of the MRB commanders; the decision to shift fires is made by the MRB commander. Batteries displace by platoons and platoons displace by bounding individual gun sections forward.
- Mortars and Howitzers: Indirect-fire weapons can be extremely valuable in the urban offense if the weapons are sited appropriately and the fires are directed against suitable targets. Mortars can be located in the upper stories of buildings where their fires can strike against the enemy in defilade behind stone fences, buildings, and walls. They can also be used to punch holes in roofs and attack enemy within buildings.
- Sappers: Sappers are attached to MR companies and platoons and are a vital ingredient in the assault team composition. Some of the missions assigned to sappers during an urban offense are to prepare approach routes, clear paths, breach obstacles, demolish individual buildings, clear mines from areas intended for C<sup>3</sup> and logistics, construct hasty obstacles to fortify seized areas, and seize and destroy nuclear charges. Sappers may also be tasked to fight fires and perform emergency rescue work if weapons of mass destruction have been used.
- Air Defense: Antiaircraft elements, generally ZSU 23-4, are sited in semiopen areas or on rooftops (SA-7 teams) and tasked to protect artillery firing positions, command centers, and other Threat elements from low altitude air attacks. A unique mission for these weapons within the city is to suppress fires originating from the upper stories of multi-story buildings.
- Aviation: Aviation assets as a whole may be used for reconnaissance, aerial platforms for artillery FOs, monitoring of enemy unit displacements, supplementing artillery suppressive fires, destruction of strongpoints, destruction of nuclear delivery means and rear CSS activities, and maintenance of air superiority conditions mandatory for a successful assault into an urban area. The HIND aircraft will normally be used for close air fire support at the FEBR.

## Urban Warfare

### THREAT MAXIMS FOR URBAN OFFENSE

- IT IS PREFERABLE TO CAPTURE A CITY FROM THE MARCH.
- ROUT ENEMY FORCES ON THE OUTSKIRTS AND KEEP THEM OUT OF THE CITY.
- CAPTURE THE CITY BY COORDINATED ATTACKS, ESPECIALLY, AND FROM FLANKS AND REAR, LESS FROM THE FRONT.
- IF THIS FAILS, BLOCKADE THE CITY, SEVER LOCs, CAPTURE IMPORTANT OUTLYING OBJECTIVES; USE MINES, OBSTACLES.
- DON'T GET BOGGED DOWN IN THE CITY, DETOUR AROUND IT AND MOVE ON.
- IF BYPASS IS NOT FEASIBLE, ATTACK FROM THE FRONT AND FLANKS AT SAME TIME.
- CITY COMBAT ACTION BREAKS INTO MANY SMALL BATTLES FOR BLOCKS AND STRUCTURES.
- DECIDE LONG BEFORE, ON THE BASIS OF INTELLIGENCE AND RECONNAISSANCE, IF THE CITY IS TO BE CAPTURED.

- STUDY TOWN, BUILDING, UNDERGROUND LAYOUT OF CITY; STUDY AXES OF ENEMY WITHDRAWAL, NATURE AND COMPOSITION OF DEFENSE--KNOW ALL OF THE ENEMY'S STRONG AND WEAK POINTS.
- USE LARGE SCALE MAPS AND PHOTOS WITH IMPORTANT OBJECTIVES DELINEATED DOWN TO COMPANY LEVEL.
- DIRECT FIRE ROLES MAY ASSUME SPECIAL IMPORTANCE, EVEN FOR LARGE CALIBER WEAPONS.
- PRESS THE ATTACK DEEP INTO THE ENEMY DEFENSES, STRIKE DECISIVE BLOWS TO MANPOWER AND EQUIPMENT, BYPASS SEPARATE ELEMENTS ON INTERMEDIATE LINES OF DEFENSE.
- DO NOT ALLOW THE ENEMY AN OPPORTUNITY TO ESTABLISH DEFENSES INSIDE THE CITY.
- MAKE USE OF STRONG ADVANCE DETACHMENTS TO CAPTURE IMPORTANT OBJECTIVES UNTIL ARRIVAL OF THE MAIN BODY.
- CAPITALIZE ON THE INFILTRATION OF SMALL UNITS INTO THE ENEMY MAIN DEFENSES AND REAR PRIOR TO THE ACTION OF ASSAULT UNITS.



CHAPTER III  
CONCEPTS OF OPERATIONS -  
CURRENT TIME FRAME



## Concept of Operations - Current Time Frame

### THE REQUIREMENT

NO LESS THAN SIX DEFENSIVE SCHEMES OF MANEUVER WILL BE USED AS PROVIDED IN MCDEC STUDY 30-77-01, "CONCEPTS OF OPERATIONS FOR LANDING FORCES IN URBAN ENVIRONMENTS DURING THE MID-RANGE." ...DEVELOP A CONCEPT STATEMENT WHICH SHALL REPRESENT... THE BEST ESTIMATE AS TO ENABLE A SUCCESSFUL MISSION COMPLETION FOR EACH SCHEME OF MANEUVER. (Statement of Work 80-0015)

### METHODOLOGY

The following concepts of operations were developed in accordance with the statement of work, which requires that at least six such concepts for defensive operations be prepared. Each concept was developed in the same manner. The Threat, which was designated by the Government, consisted of a MRD approaching SYN City from the northwest and another MRD plus an airborne division approaching from the southwest. In addition, an internal threat to the MAF defenses exists from partisan groups and MRB remnants within SYN City. The threat remains the same for each mission assigned by the government.

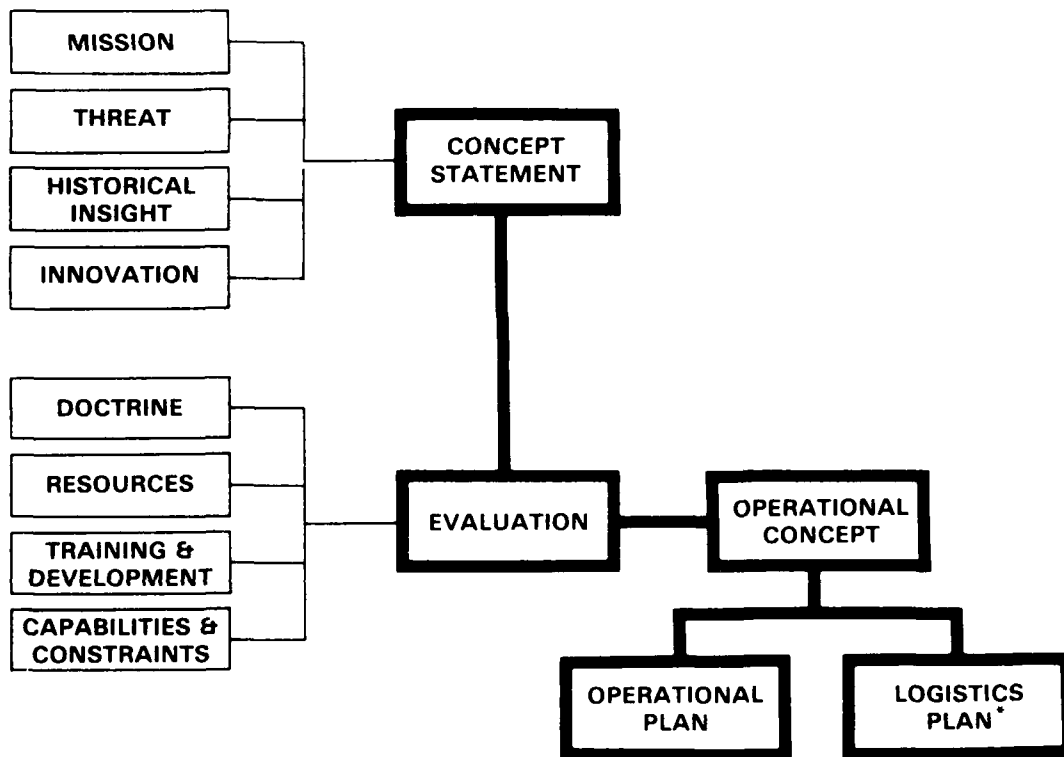
The government then assigned six separate missions, broadly described as follows:

- Defense Outside the City
- Defense Inside the City
- Defense in Depth
- Defend Key Sectors
- Entrap and Ambush
- Mobile Defense

The analysts then studied the missions, Threat courses of action, and historical examples of amphibious operations as well as military operations in urban areas. Concept statements were then prepared, describing how each of the missions would be accomplished in a defense of SYN City. It should be noted that the analysts were limited to the SYN City model area and were prohibited from landing and defending elsewhere along the coast. This restriction was imposed to assure that an urban defense resulted and the service support element of the Landing Force was properly exercised and evaluated in an urban environment.

Concept statements were then evaluated against Marine Corps doctrine, training and development, resources, and capabilities and constraints. These concepts then served as the basis for developing the basic operation plan, including the logistic and combat service support annexes, and the outline or concept plans contained in Volume IV, "Defensive Operation Plans-SYN City".

The concepts delineated in this chapter relate to the current time frame. Concepts for the mid-range period are in Chapter IV.



\*APPROPRIATE ANNEXES IN THE OPLAN.

Figure III-1. Developmental Approach to Operational Concept

## Concept of Operations - Current Time Frame

### GENERAL AND SPECIAL SITUATIONS

THE GENERAL AND SPECIAL SITUATIONS SET FORTH HEREIN APPLY TO EACH OF THE SIX DEFENSIVE MISSIONS ASSIGNED TO VII MAF. THE MISSIONS DIFFER IN VARYING DEGREES AS DO THE CONCEPTS OF OPERATION.

#### General Situation

Hostilities broke out between the United States and the Aggressor nation in February 19\_\_, and a series of indecisive air and naval skirmishes took place during the next several weeks.

In May 19\_\_, Amphibious Task Force 51, with VII Composite Marine Amphibious Force (VII MAF) embarked as the Landing Force (TF 59), conducted an amphibious assault at SYN City in southern Aggressorland. That region was defended by a motorized rifle division, a battalion of which was within the metropolitan limits of SYN City.

In conjunction with ATF Advance Force operations, theater-based US and allied air forces conducted air strikes throughout southern Aggressorland from D-5 through D-1. An amphibious demonstration and amphibious feints succeeded in fixing in place the preponderance of the enemy units that were capable of reinforcing the SYN City garrison, thereby enabling the Landing Force to seize their initial objectives on D-day, essentially as planned. Thereafter, heavy resistance was encountered only in the naval station area, which was secured on D+3, and in the main port area, which was not consolidated until D+5. Survivors from the Aggressor MRB defending the port area withdrew into New City and nearby suburban areas. They continued to resist efforts by VII MAF to occupy the city until D+9, after which only occasional sniper action was encountered.

Tank and motorized rifle units of the MRD located outside of SYN City were under heavy air attack around the clock through D+5, suffering heavy attrition. These units were also engaged by VII MAF mechanized combined arms task forces formed around the two tank battalions.

The Force Beachhead Line (FBHL) was secured by D+6. By D+10 the immediate Aggressor ground force threat ended. The amphibious operation was terminated on D+10; CG VII MAF chopped OPCON to the Unified Commander; TF 51, less several reassigned ships, remained in support of VII MAF.

### Special Situation

Beginning on D+6 the Aggressor Air Force achieved air parity in southern Aggressorland. Intelligence reports indicated the deployment of three additional Aggressor divisions toward the southern region. These forces consisted of an MRD moving from the northwest and an airborne division and another MRD approaching from the southwest. By D+10 the advance elements of the Aggressor divisions were generally within 150 km of SYN City.

Taking into consideration the military situation worldwide on D+10, the Joint Chiefs of Staff recommended that the Unified Commander direct VII MAF to undertake the deliberate defense of SYN City without delay, until the arrival of follow-on forces. The Unified Commander further directed that the VII MAF prepare a defensive operation plan for submission to him. That plan, and plans that were being required of other combat commands, would serve as a basis for JCS/DOD evaluation of military requirements and priorities in the region.

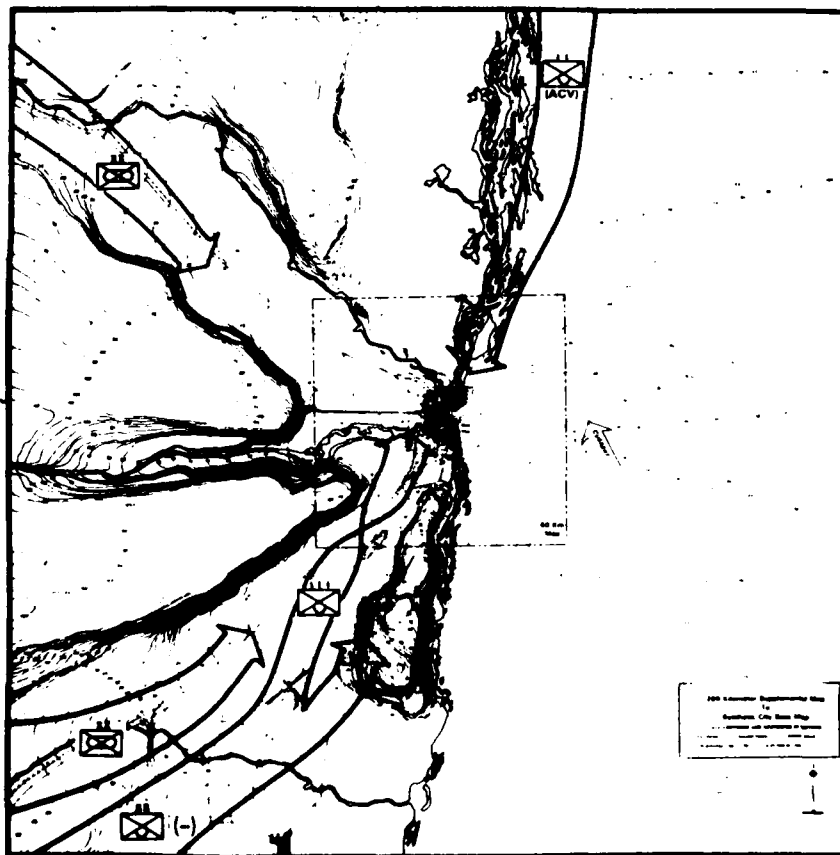


Figure III-2. Avenues of Approach for Aggressor Divisions

## Concept of Operations - Current Time Frame

### THREAT SITUATION

TWO AGGRESSOR MOTORIZED RIFLE DIVISIONS AND AN AIRBORNE DIVISION ARE ADVANCING TOWARD SYN CITY ON MULTIPLE AXES. THESE DIVISIONS ARE AUGMENTED BY REMNANTS OF THE MRD THAT WAS RENDERED COMBAT-INEFFECTIVE BY VII MAF DURING THE AMPHIBIOUS ASSAULT OF SYN CITY AND WHICH WERE FORCED OUT OF THE FBH AREA. THESE UNITS CONSTITUTE THE MAJOR THREAT TO VII MAF DURING ITS DEFENSE OF SYN CITY. DISSIDENT CIVILIAN ELEMENTS WITHIN SYN CITY ARE AN IMMEDIATE BUT MINOR THREAT.

This section is intended to provide information concerning the results of offensive action by VII MAF prior to D+11, the effects of this action upon the MRD originally opposing the Landing Force, and the new threat to VII MAF posed by additional Aggressor forces. The unsuccessful efforts of the MRD to repulse and destroy the Landing Force and the loss of SYN City and its port prompted the Combined Arms Army commander to commit other major forces to regain control of the SYN City area by offensive action. These newly committed divisions were approximately 150 km distant from SYN City on D+11.

The deployment of the original MRD near SYN City at the onset of hostilities is shown in the figure opposite. During the course of the offensive period, these units were subject to attack and attrition by various elements of VII MAF and supporting carrier air assets. The methods of attack and attrition levels for each of the principal Aggressor force groupings comprising the MRD (Rein) are noted below. Attrition levels represent subjective estimates by BDM analysts based on relative force capabilities and the general concept of operations envisioned during the deliberate assault of SYN City.

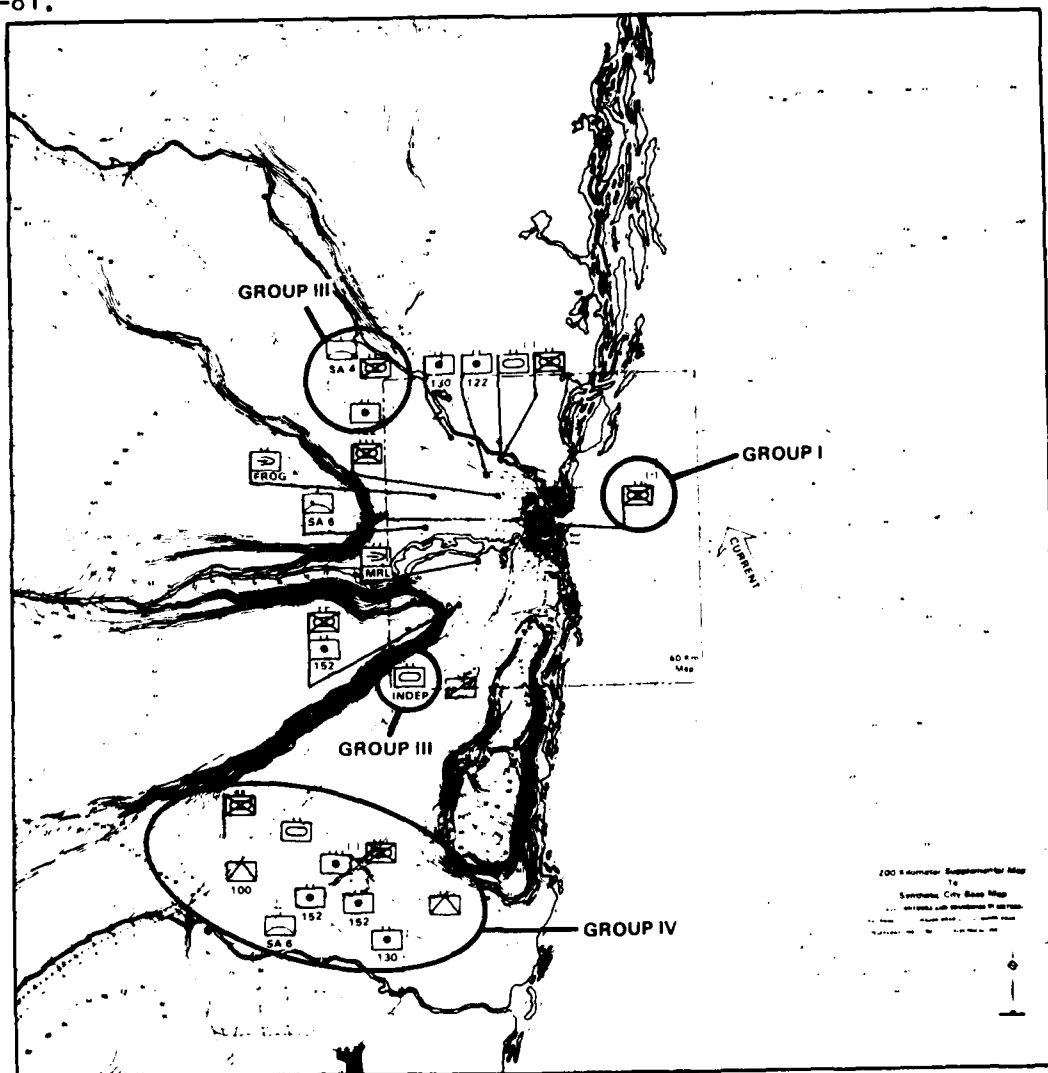
TABLE III-1. COMBAT ACTION AGAINST AGGRESSORLAND MRD - D-5 to D+10

UNIT GROUPING	UNITS	METHOD OF ATTACK	UNIT EFFECTIVENESS BY D+10	SUBSEQUENT ACTION	MAJOR WEAPONS SYSTEMS REMAINING
I	MRB(+) (IN SYN CITY)	3,4,6*	10%	IRREGULAR W/ IN SYN CITY	NONE
II	MRR(-) (INCL TK BN) FMOC BN, SA-6 BTRY ARTY REGT	1,2,3	25%	REORGANIZES AS MRD (REIN)	30 APC
		5,7	10%	FLANK SECURITY FOR APPROACHING MRDs	10 T-72
			25%		18 122 HOW
III	MRR, 122 HOW BN, TK BN (INDEP)	1,2,3 5,7	50%	DELAYS AND ESTABLISHES BLOCKING POSITIONS	60 APC 25 T-72
IV	MRR, TK REGT ARTY REGT(-), AT BN SA-6 BTRY	1,2,7	50%	REINFORCES SOUTHERN AGGRESSOR DIVISIONS	60 APC 50 T-72
			25%		10 152 HOW 5 122 HOW 4 FT G

- \* 1 - TG 57 (CARRIER AIR)
- 2 - THEATER AIR INCL 7TH MAW (REAR)
- 3 - 7TH MAW (FWD)

- 4 - TG 51.4 (NAVAL GUNFIRE SUPPORT GROUP)
- 5 - 10TH MARINE REGT (ARTY)
- 6 - 7TH MAR DIV (-)
- 7 - MCATFs

The most logical course of action for each of these Aggressor groupings, except for the MRB remnants within SYN City, would be to conduct delaying actions until the arrival of reinforcing divisions. These delaying actions could be in conjunction with the establishment of temporary blocking positions. The remnants could then be used to reinforce the additional divisions committed by the Southern Aggressorland Command. Courses of action for these divisions are outlined in Annex B to Oplan 6-81.



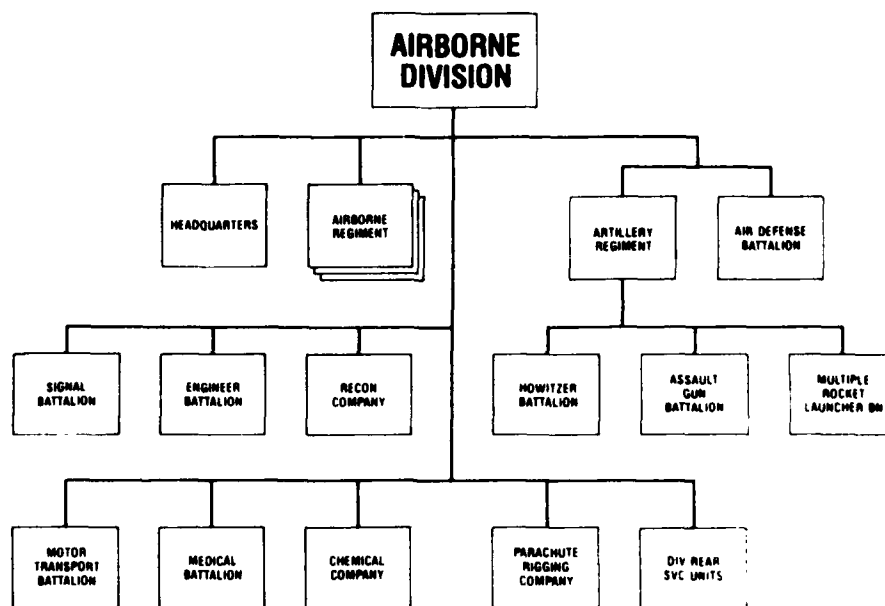
NOTE—ALL UNITS SHOWN ARE AGGRESSOR UNITS  
—UNITS NOT WITHIN GROUPS I, III, AND IV ARE IN GROUP II

Figure III-3. Aggressor MRD Groupings Based on Attrition and Method of Attack

10



# AIRBORNE DIVISION



	PERSONNEL			WEAPONS & EQUIPMENT																	
UNITS	OFFICER	ENLISTED	TOTAL	7.62mm LMG RPK PK	23mm AA GUN ZU-23	57mm AT GUN (SPI) ASU-57	85mm AT GUN (SPI) ASU-85	ATGM VEH AT-23	ATGM MAN- PACK AT-3	72mm REL GUN SPG-9	85mm AT GL APG-7	82mm MORT M1937	122mm HOW D-30	140mm RL RPU 14 WP 8	AFV BMD	AFV BDRM-2	ARVT-4 T	TRK	MTRCL	RADAR (Grnd Surv) GS-12	SA-7 GRAIL
HQ AND SVC ELM	101	527	628												2		2	230	5		
ABN REGT (3x)	555	5433	5988	243	18	27		27	27	81	270	54	18		321	63	18	495	27	1	105
DIV ARTY ELM	114	672	786		18		18						18	18	7	4	1	147			6
RECON CO	6	50	56								9				3	9		1	5		4
ENGR BN	28	270	298												13	6	1	28			2
SIG BN	21	178	199															40	3		
CML CO	5	48	53													5		17			2
TOTAL	830	7178	8008	243	36	27	18	27	27	81	279	54	36	18	345	87	22	958	40	1	119

Figure III-5. Typical Aggressor Airborne Division



## Concept of Operations - Current Time Frame

### MISSION 6 - DEFENSE INSIDE THE CITY

INNER DEFENSE LOCATIONS ARE SELECTED WHEN HOSTILE FORCES ARE ESPECIALLY STRONG IN LONG-RANGE FIRES FROM ARMOR AND ARTILLERY AND THE DEFENDER WISHES TO LIMIT THE EFFECTIVENESS OF THESE FIRES. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends in place to protect SYN City from infiltration and penetration in force, with priority to Port Area, Airfield 2, and CSSA; until follow-on forces are landed.

### General Concept of Operations

VII MAF will establish the FEBA inside the SYN City metropolitan boundary to gain increased protection from enemy air, artillery, and armor fires. Forward defense forces will be positioned in depth with local security and combat outposts under regimental and divisional control respectively. The MAF GOPL will be positioned along the current trace of the FBHL.

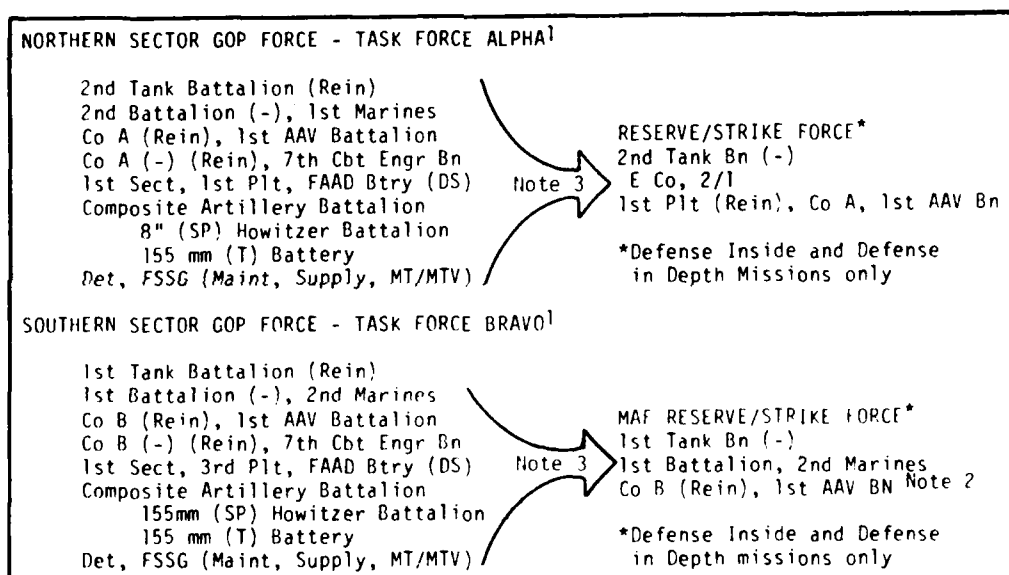
The GOP area will be comprised of a northern sector manned by the 2nd Tank Battalion MCATF (Task Force ALPHA) and a southern sector manned by the 1st Tank Battalion MCATF (Task Force BRAVO). The MCATFs will provide observation, reconnaissance, long-range fires, and offensive and defensive operations to delay the enemy, inflict casualties, cause early deployment of advancing enemy columns and, by the use of natural and artificial obstacles, canalize the advancing enemy forces into avenues of approach more favorable to the MAF.

Upon withdrawal behind the FEBA, the MCATFs will be dissolved and the tank battalions will become the nuclei for mobile strike forces in the northern and southern defensive sectors (central and southern peninsulas). The tank battalions will also prepare tank and ATGM firing positions to support infantry strongpoints in key sectors and vital areas. All forces along the FEBA will engage the Aggressor at maximum range with a high volume of artillery and antitank fires, supported by air and naval gunfire bombardment, to stop the enemy forward of the FEBA. Mechanized counterattacks will be employed to destroy enemy forces that are canalized and stopped forward of the FEBA and which cannot be destroyed by other means. Enemy forces penetrating the FEBA will be destroyed or ejected by local counterattacks whenever possible to gain control of the forward defense area.

Observation will be maintained over all likely drop zones and helicopter landing zones inside the city that might be used by the Aggressor forces, and local commanders will be prepared to establish defenses

against, fire on, contain, and destroy airborne or heliborne forces. Coast watch against Aggressor air cushion vehicle (ACV) counterlandings will be maintained by Force Reconnaissance Teams inserted into RAOs near the off-shore islands (northern peninsula) and the palisades (southern peninsula). The 7th FSSG and 10th Marine Regiment will be responsible for counterlanding plans and operations within their respective areas of responsibility.

For control purposes, three phase lines have been designated to facilitate an orderly withdrawal and continuity of the defense should the Aggressor forces succeed in penetrating the FEBA in strength and force forward defense area units to effect a retrograde movement. Defense forces in the forward defense area will not deploy to successive phase lines without approval of CG VII MAF. Retrograde movements will be conducted as delaying actions unless otherwise directed.



- Notes:
1. Applicable to all 5 missions inside the city.
  2. On order.
  3. After GOP forces withdraw, some units revert to parent control while others become part of reserve/strike forces.
  4. No Western Sector GOP Force for the 5 missions inside the city.

Figure III-6. Composition of GOP and Reserve/Strike Forces

## Concept of Operations - Current Time Frame

### Mission 6 - Defense Inside the City (Continued)

The assignment of units as reserve forces is the same for the missions of Defense Inside the City and Defense in Depth. These two missions were viewed by BDM analysts as being almost identical in the deployment of major defensive units.

- Units north of South River - 5 Inf Bn and 2nd Tank Bn
- Units south of South River - 4 Inf Bn and 1st Tank Bn

Additional details concerning the designation and control of reserves, as noted on the preceding graphic, are given below.

#### VII MAF Reserve - 1st Tk Bn (-), 1/2 (-) (Rein), Co B 1st AAV Bn

- 1/2 is to be prepared to deploy by helicopter anywhere within the FEBA on order.
- 1/2 is to be prepared to provide direct support to 1st Tank Bn as mechanized infantry.
- 1/2 is to be prepared to revert to operational control of CG 7th Mar Div on order.

#### 7th Mar Div Reserve - 2nd Tank Bn (-), E/2/1, AAV Co

- Advise CG VII MAF if and when reserve is committed.
- Be prepared to provide LVTs to VII MAF Reserve (1/2) if that unit redeploys by helicopter to positions north of South River.

1st Marines - None, but regimental commander has a "string" on the reserve company of 1/1.

2nd Marines - None, but regimental commander has a "string" on the reserve company of 3/2.

3rd Marines - MAF Reserve within regimental sector plus "string" on reserve company of 1/3.

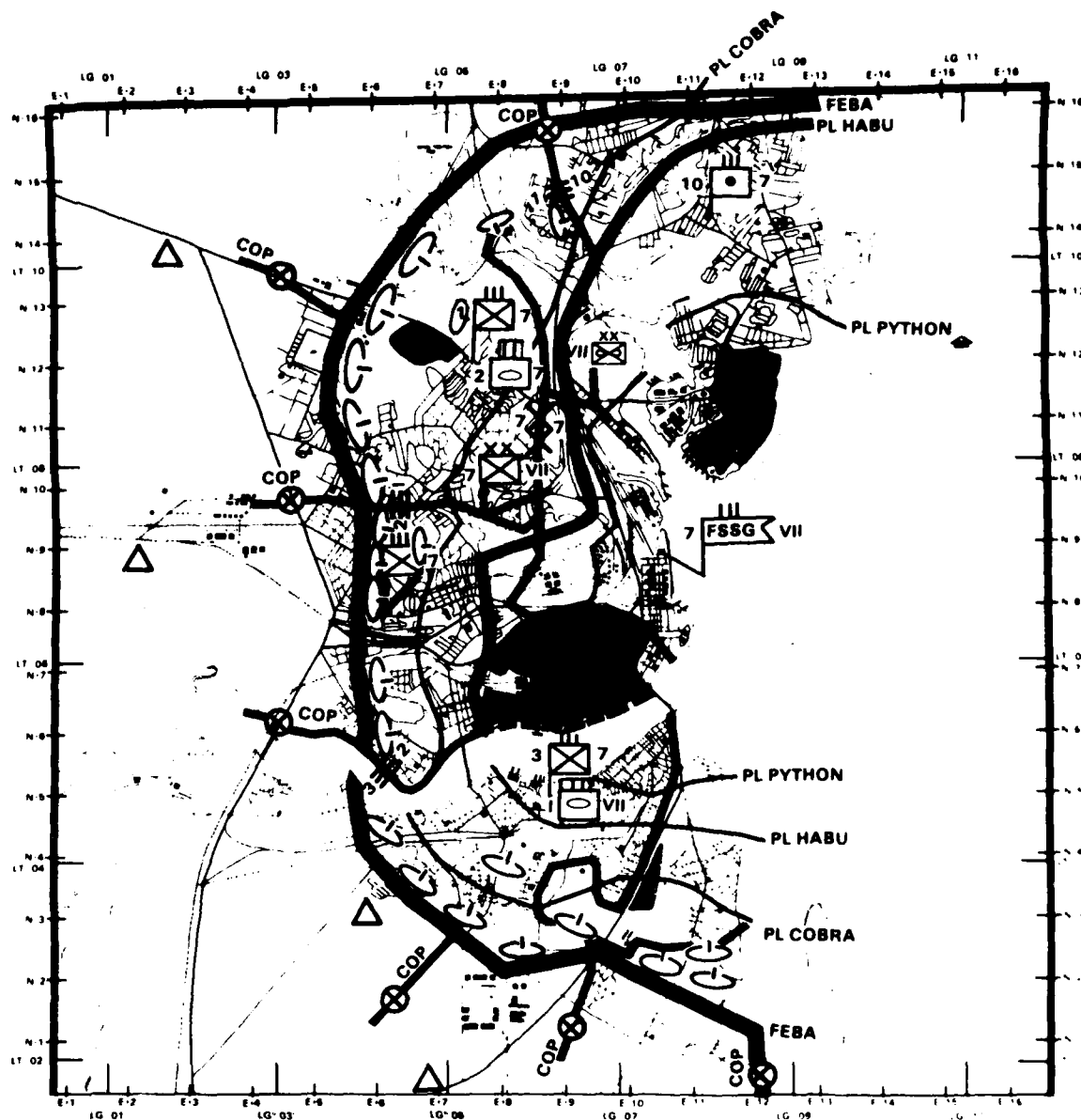


Figure III-7. Concept of Operations - Defense Inside the City

## Concept of Operations - Current Time Frame

### Mission 6 - Defense Inside the City (Continued)

#### Combat Service Support Concept

The combat service support concept for all five missions of defense inside the city is influenced to a great degree by the need to disperse supply stockages and CSS activities to preclude interdiction during intense inner-city fighting when all areas within the city may be within range of Aggressor mortars and artillery. A requirement also exists for the stockage of critical supplies (Classes I and V) at forward locations so that units in contact will be able to effect their own resupply until such time as normal distribution activities can continue. Selected supplies will be stockpiled at forward sites so that units forced to conduct delaying actions will fall back on their supplies.

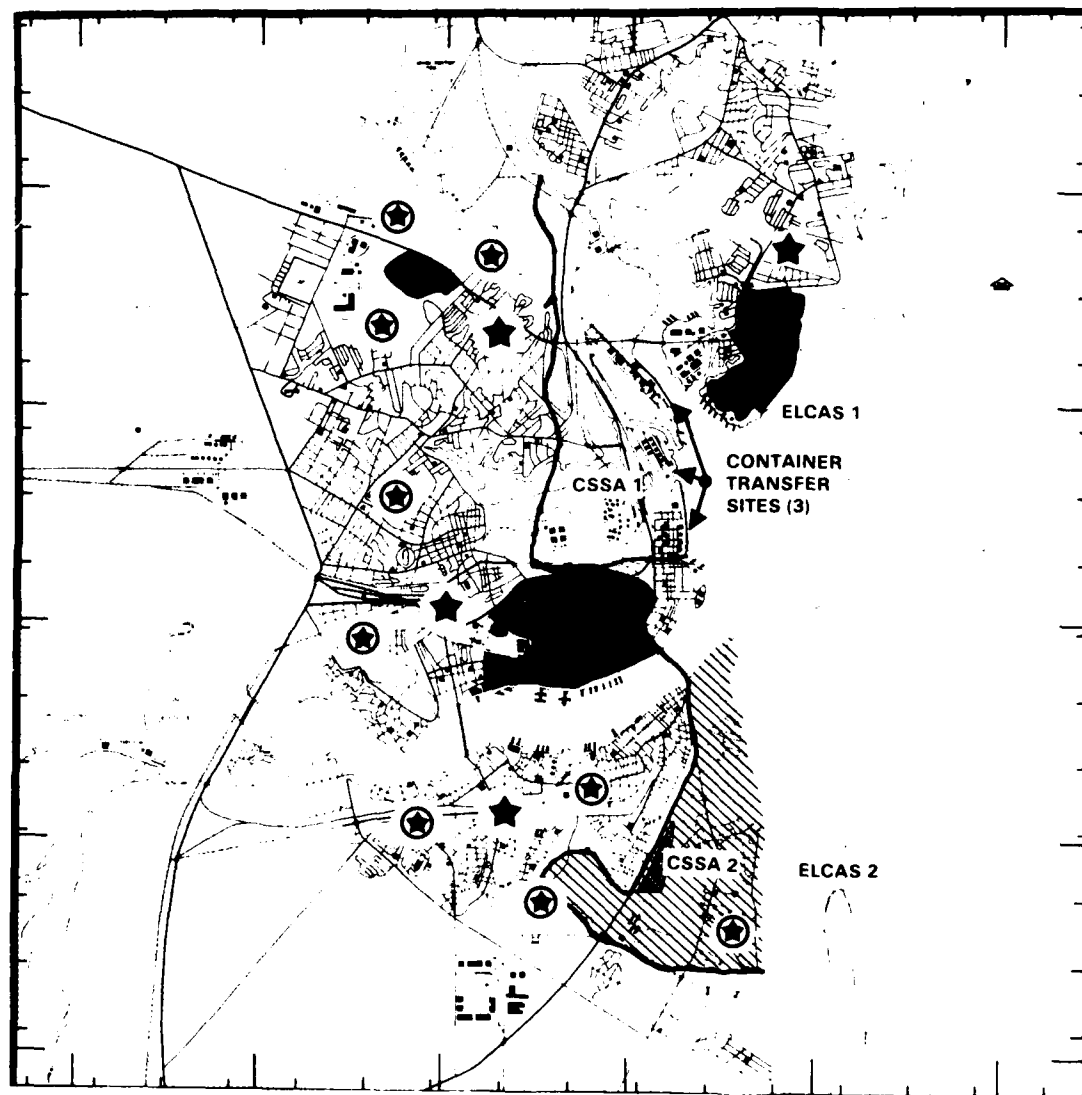
CSSAs 1 and 2, established during the offensive phase of the SYN City operation, will serve as the primary focal points for the offloading and marshalling of containerized supplies as well as the remainder of the AFOE. Elevated causeways (ELCAS) at Beaches RED and BLUE will augment the throughput capability within the main port area. The FSSG headquarters will remain in the port area as will the headquarters of subordinate FSSG battalions. Large containers ( $\geq 20'$ ) will be offloaded from containerships or lighterage and transported to the container marshalling areas by container-compatible semi-trailer combinations. Once at the marshalling area, supplies may be stored within the large container or reconfigured into smaller-sized loads and transported to more forward stockage points.

Four Intermediate Support Points (ISPs) will be established in the suburban areas with one ISP in support of each regiment (three infantry regiments plus one artillery regiment). A full range of CSS will be available at each ISP to include maintenance, medical, engineer, supply, and motor transport services. The ISPs will serve as intermediate container handling areas where MILVAN or QUADCON-sized loads are reconfigured as QUADCON or PALCON-sized loads ready for transport to forward units. FSSG slices (roughly equivalent to a MAU slice) will provide the CSS nucleus at each ISP supplemented by divisional and MAW CSS elements as required.

For supply dispersion purposes there are two additional echelons of supply stockages. Selected supplies will be stockpiled at approximately nine battalion-level locations as well as twenty-seven forward points. These forward support and forward sites are used primarily for supply stockage while the remainder of CSS is provided by activities located at ISPs and CSSAs. Supplies will be sited within structures whenever possible to protect them from pilferage and indirect fires.

Stockage levels at each logistic activity depend on the units being supported as well as the individual supply class. Additional details concerning stockage levels can be found in the Supply section of Chapter V.

Class III (Bulk) and Class V supplies are dispersed at CSSAs and ISPs. Land area requirements for ammunition storage have been significantly reduced via the use of modular storage concepts. This storage concept is addressed in greater detail in Chapter V. V/STOL aircraft remaining in the FBH are dispersed at four major V/STOL facilities in proximity to the ISPs.



★ TENTATIVE LOCATION OF INTERMEDIATE SUPPORT POINT

★ TENTATIVE LOCATION OF FORWARD SUPPORT POINT

NOTE: FORWARD STOCKAGE POINTS NOT SHOWN

Figure III-8. Tentative Location of CSS Activities - Defense Inside the City

## Concept of Operations - Current Time Frame

### MISSION 7 - DEFEND KEY SECTORS

THIS CONCEPT MAY BE EMPLOYED WHEN THE MARINE CORPS LF MISSION REQUIRES THAT ONLY A PORTION OF AN URBAN AREA BE HELD OR WHEN MARINE CORPS LF STRENGTH IS INSUFFICIENT TO ATTEMPT TO DEFEND THE ENTIRE AREA. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends SYN City with priority to Port Area, Airfield 2, and CSSAs; be prepared to support the landing and deployment of follow-on forces on or after D+30.

### General Concept of Operations

The basic concept for the Defense of Key Sectors is virtually the same as for the Defense Inside the City and Defense in Depth missions within the overall context of the SYN City Defense. Forces along the GOPL remain the same and the unit deployments within the FEBA are similar. This similarity stems from the fact that retention of these key sectors is vital in any of the defensive missions, and these sectors cannot be reasonably defended unless the forward defense area is along the metropolitan boundary.

If the FEBA is driven back, Phase Line CUTLASS is the next best line of defense. However, withdrawal to PL CUTLASS sacrifices Airfields 1 and 2, the latter having been designated key sector D. The exposed location of the two airfields makes them subject to early attack during the Aggressor ground offensive. If Aggressor ground and air forces make the airfields untenable, all VII MAF fixed-wing aircraft (less V/STOL) will redeploy to available LHA/LPH ships and/or to theater air bases (TABs), from which they will continue to provide air support to the remainder of the MAF. V/STOL aircraft and elements of the helicopter MAGs will remain ashore and operate from V/STOL facilities and FOBs dispersed throughout the city.

Key sectors A (Port) and B (BSA Red) are vital to the success of this mission. They will be retained at all cost to assure that follow-on forces can be landed and deployed in accordance with the assigned mission. Key sector C and all of the area within PL DAGGER south of South River must be denied to the Aggressor forces. Loss of that sector would uncover the port area and the deep-channel entry to the port and reduce the defensive perimeter to an unacceptable degree. Follow-on forces could not feasibly land in the port and VII MAF units ashore would have no alternative except to conduct a house-to-house defense within Old and New Cities.

THE CSS CONCEPT REMAINS THE SAME AS PER MISSION 6.

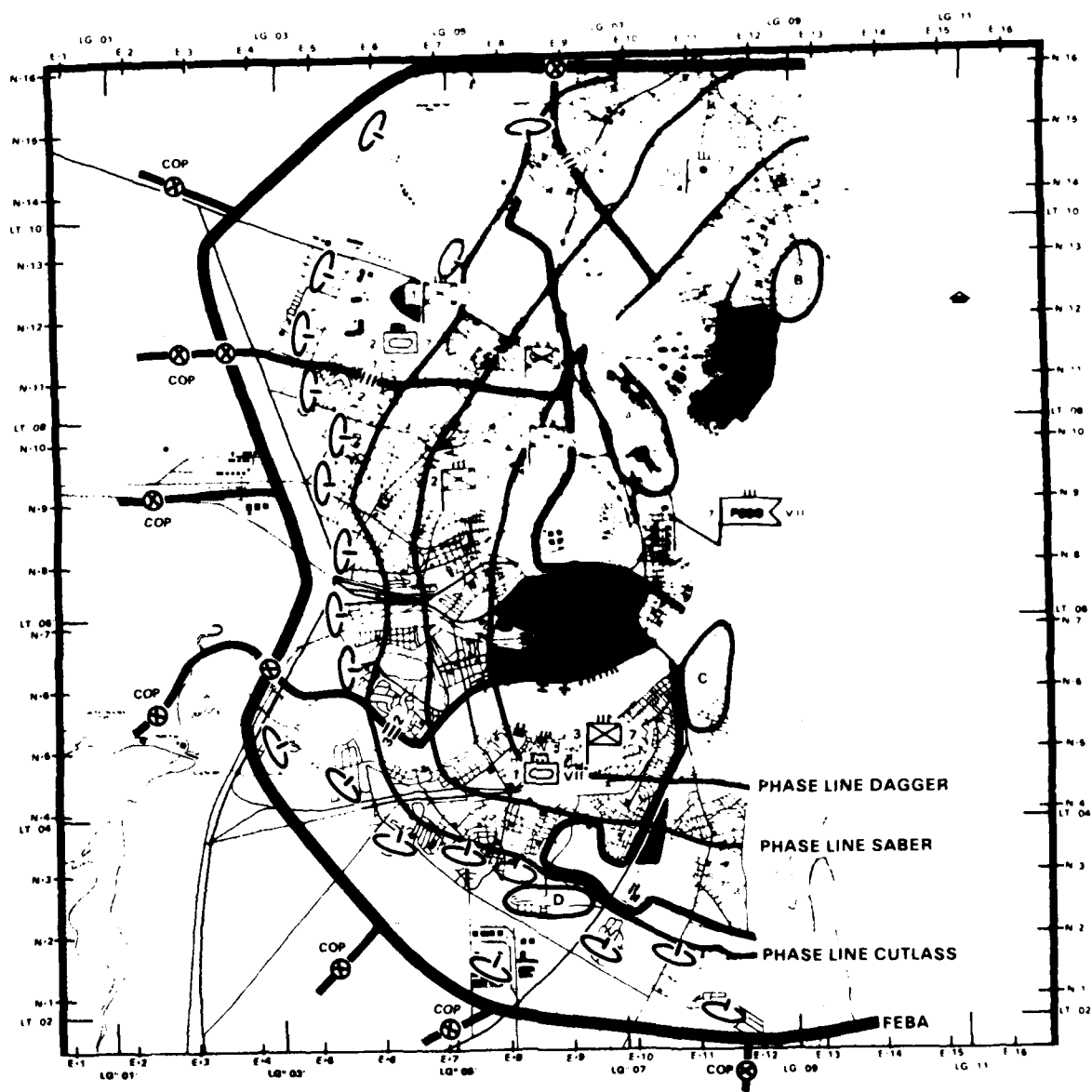


Figure III-9. Concept of Operation - Defend Key Sectors



## Concept of Operations - Current Time Frame

### MISSION 8 - ENTRAP AND AMBUSH

THIS CONCEPT REQUIRES THE PREPARATION OF A SERIES OF BLOCKING AND AMBUSH POSITIONS ALONG MAJOR ARTERIES LEADING THROUGH THE URBAN AREA (AND)... WOULD BE PREFERRED WHEN THE DEFENDER LACKS REQUISITE STRENGTH TO MAN ORGANIZED DEFENSE IN-DEPTH POSITIONS. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends in place to protect SYN City from infiltration and penetrations in force until follow-on forces are landed and deployed, a period estimated to be between D+30 and D+45; thereafter, be prepared to attack to the northwest.

### General Concept of Operations

VII MAF will establish the FEBA generally along the SYN City metropolitan boundary. Forward defense forces will provide combat outposts and local security forward of the FEBA. Extensive minefields, antitank ditches, roadblocks, and other obstacles will be installed to help protect the forward defense area and canalize hostile elements into the desired ambush kill zones. All obstacles will be covered by observation and fire.

Within the kill zones, additional obstacles will be installed to confine the Aggressor penetration and deny him the ability to escape the pocket. Houses, buildings, and other structures not required by 7th Mar Div units will be barricaded to prevent entry, thereby keeping Aggressor troops outside the structures where they can be observed and engaged. Other structures that are particularly vulnerable to supporting arms or machine gun fire may be left unbarricaded; these structures will be booby-trapped and covered by preregistered indirect fires and direct automatic weapons fire.

Mortar fires, artillery fires, and close air support will be pre-planned to the maximum degree possible. Tanks and TOW missile carriers will be positioned to fire along major arteries and into open areas within the ambush kill zones. This concept provides for the destruction of Aggressor forces by fire. Regimental commanders will prepare alternate plans to block and ambush Aggressor forces that avoid the prepared kill zones. Plans will also be prepared to launch counterattacks against the enemy if fire power fails to eject or destroy him.

GOP forces are the same as those delineated in the mission of Defense Inside the City. The reserves at MAF and division level, however, are lighter due to the requirement for extensive fire power at the ambush and kill zones. VII MAF has no reserves per se but has a "string" on one battalion north of South River and one battalion south of South River. The

7th Mar Div should be prepared, on order, to deploy an infantry battalion by helicopter or LVT across South River if the situation dictates. 7th Mar Div reserves are composed of a battalion (-) (rein) of 2nd Marines (-). This groupment would consist of 2 Rifle Co, 1 Wpns Co (-), 1 Tank Co, 1 AT Plt, and 1 AAV Co. It should be noted that each battalion has one company in a reserve or supporting position. Therefore, each regiment will have a "string" on the reserve/support company of the least committed battalion.

THE CSS CONCEPT REMAINS THE SAME AS PER MISSION 6.



Figure III-10. Concept of Operations - Entrap and Ambush

## Concept of Operations - Current Time Frame

### MISSION 9 - DEFENSE IN DEPTH

DEFENSE IN DEPTH WILL GENERALLY BE CONSIDERED WHEN THE ENEMY POSSESSES ARMOR AND THERE ARE ADEQUATE ARMOR AVENUES OF APPROACH AVAILABLE. THIS CONCEPT REQUIRES THE LOCATING OF STRONGPOINTS IN DEPTH ALONG ARTERIES LEADING INTO THE CITY. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends in place to protect SYN City from infiltration and penetrations in force until follow-on forces are landed and deployed, a period estimated to be between D+30 and D+45; thereafter be prepared to attack to the northwest.

### General Concept of Operations

The mission of Defense in Depth is virtually identical at MAF level to that of Defense Inside the City. Both missions direct VII MAF to defend in place. This is construed to mean that the GOP will be established along the general trace of the FBHL which was secured by D+6. The newly emerging enemy threat is strong in armor and long-range artillery, thus militating in favor of defending in depth inside the city. The mission statement provided for this plan does not specify priority areas to be defended as is done in the mission of Defense Inside the City, wherein the port area, Airfield 2, and the CSSAs are given defensive priority. Nevertheless, these areas must be held to accommodate the landing of follow-on forces. In the mission statement, the arrival of the follow-on forces is anticipated between D+30 and D+45. No time period is specified in the mission Defense Inside the City but in Phase I of this study those forces were scheduled to arrive on or after D+30. In this regard the two plans are similar.

The configuration of SYN City influences the defensive posture and limits the tactical options that can seriously be considered at MAF level. A significant penetration anywhere in SYN City constitutes a serious threat to continuity of the defense. The metropolitan boundary is only 5 to 8 km inland from the sea, and the city measures about 15 km from north to south. When Aggressor forces engage MAF units on the FEBA, Aggressor artillery and mortars of all calibers are well within range of the city.

Within SYN City, there are very few open, trafficable areas suitable for mobile defense using tanks and mounted infantry. In the SYN City context both Defense Inside the City and Defense in Depth are based on aggressive employment of MCATF GOP forces initially to prevent the enemy from reaching SYN City. If the GOP is forced to withdraw by numerically superior Aggressor forces, the enemy will be taken under continuous air attack. Long-range artillery and naval gunfire will be employed as soon as the Aggressor forces are within effective range for both Defense Inside the

City and Defense in Depth missions and an area defense will be adopted. The significant armor and artillery threat posed by the attacking Aggressor forces makes it advisable to locate the FEBA inside the metropolitan boundary where possible. The outer shell of the suburban area will contain the COP established by the division commander. Actual and dummy minefields will be installed forward of the FEBA to deceive and/or canalize the attacker. The preponderance of the mines available will be emplaced within the city to supplement the defense in depth and create killing zones in suitable areas inside the city. ATGMs will be deployed in depth along likely avenues of approach to and within the city. The tank battalions will reconnoiter and prepare supplementary positions to support infantry strong points that are under enemy attack and to rehearse local counterattacks where the urban terrain favors the use of armor.

THE CSS CONCEPT REMAINS THE SAME AS PER MISSION 6.

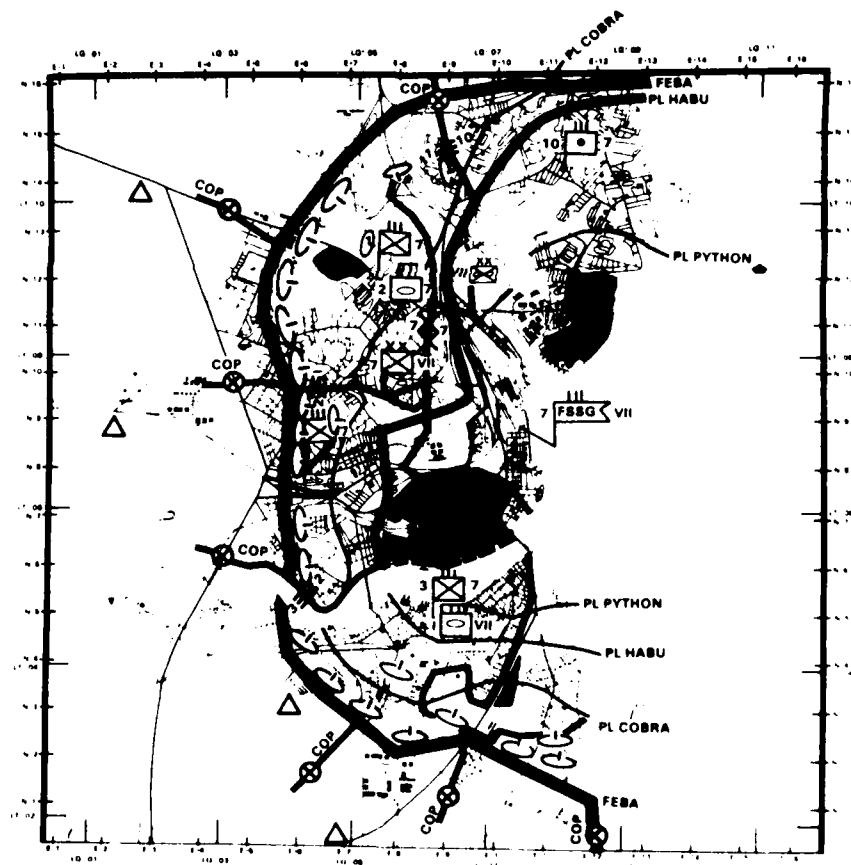


Figure III-11. Concept of Operation - Defense in Depth

## Concept of Operations - Current Time Frame

### MISSION 10 - MOBILE DEFENSE

MOBILE DEFENSE WOULD BE (CONSIDERED IF) ... THE MARINE CORPS LF IS CHARGED WITH DEFENDING AND RETAINING AN URBAN AREA AGAINST A SUPERIOR FORCE OR THE SIZE OF THE URBAN AREA EXCEEDS THE LF CAPABILITY TO ESTABLISH AN EFFECTIVE DEFENSE ALONG THE FEBA. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends in place to protect SYN City from infiltration and penetrations in force until follow-on forces are landed and deployed, a period estimated to be between D+30 and D+45; thereafter, be prepared to attack to the northwest.

### General Concept of Operations

VII MAF will establish the FEBA generally along the outer edge of SYN City. GOP forces will conduct MCATF operations to delay the enemy forward of the GOP and force his premature deployment. Thereafter, without becoming decisively engaged, the GOP MCATFs will conduct a series of delaying actions to slow the Aggressor's progress and inflict casualties. The COP and local security forces will cover the withdrawal of the GOP forces through the FEBA.

The bulk of the GOP forces will then occupy blocking or supporting positions within the FEBA from which they can reinforce engaged units or counterattack enemy penetrations of the FEBA. A tank battalion reinforced with an infantry company mounted in LVTs will act as the mobile reserve north of South River for counterattacking Aggressor forces that penetrate the FEBA into relatively open areas. An infantry battalion, minus one company initially mounted in LVTs, will be the mobile reserve for commitment against penetrations that occur in built-up areas where tanks cannot be employed effectively. This infantry battalion (-) will be prepared to fight dismounted in urban/suburban areas and will also be prepared to reinforce the tank-infantry team referred to above.

South of South River a tank battalion and an infantry battalion mounted in LVTs will be the mobile reserve to counterattack the assumed penetration or any other penetration that might actually occur. This concept provides for ejecting or destroying the Aggressor penetrations through offensive action. If the mobile defense does not develop as planned, the reserves may be used to occupy blocking positions or reinforce strong points.

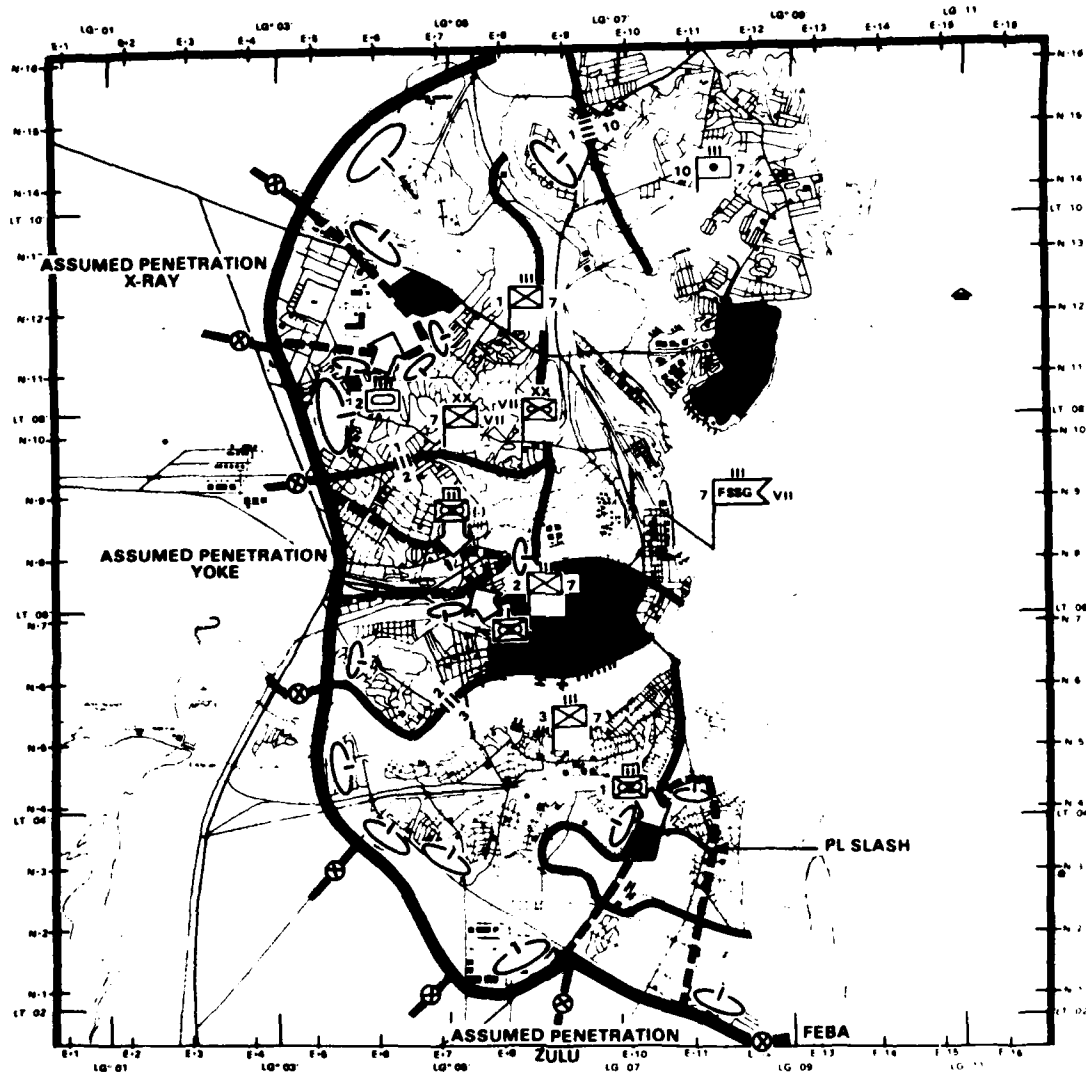


Figure III-12. Concept of Operation - Mobile Defense

Concept of Operations - Current Time Frame

Mission 10 - Mobile Defense (Continued)

PENETRATION X-RAY

- 3/1 defends northern industrial area initially.
- Withdraws across open area to next suburban area.
- Defends suburban area, stops penetration.
- Priority of fires to Strike Force on order (when fixing unit 3/1 reaches its fall-back defensive positions and seals the gap).

<u>STRIKE FORCE</u>	<u>2ND TANK BATTALION (-) (REIN)</u>	(TANK-HEAVY)
	Battalion Command Group	
	Cos A, C, & D 2nd Tk Bn	
	Cbt Engr Plt	
	AT Plt	
	Co A, 2/1 (Rein)	
	AAV Plt (Rein)	

PENETRATION YOKE

- 1/2 defends western suburbs.
- Withdraws two companies to final defensive positions.
- Defends vicinity of New City, stops penetration.
- Priority of fires to Strike Force on order (when fixing unit 1/2 reaches fall-back defensive positions and seals gap).

<u>STRIKE FORCE</u>	<u>2ND BN, 1ST MARINES (-) (REIN)</u>	(MECH-HEAVY)
	Battalion Command Group	
	Cos B, C, & Wpns 2/1	
	Cbt Engr Plt	
	AT Plt	
	Co B, 2nd Tk Bn	
	Co B (Rein), AAV Bn	

PENETRATION ZULU

- 2/3 defends FEBA south of inlet.
- Withdraws two companies into CSSA 2.
- Defends and halts penetration at natural obstacles formed by inlet and sanitary landfill.
- Priority of fires to Strike Force on order (when fixing unit 2/3 reaches fall-back defensive positions and seals gap).

<u>STRIKE FORCE</u>	<u>1ST TANK BATTALION (REIN)</u>	(TANK-HEAVY)
	1st Tk Bn	
	3rd Bn, 2nd Marines	
	Co B (Rein), AAV Bn	
	Cbt Engr Plt	

Figure III-13. Penetration Point/Strike Forces - Mobile Defense

### Combat Service Support Concept

The CSS concept for the Mobile Defense mission is basically the same as for all other missions to defend within the city. The primary differences lie in the specific location of Intermediate Support Points (ISPs) and the configuration of CSSA 2. ISPs must be located in areas not threatened by the assumed penetrations and subsequent actions by the penetration strike forces. The vulnerability of CSSA 2 to collateral damage by Aggressor forces at Penetration ZULU warrants the relocation of critical supplies to more northern locations within the CSSA. The figure below shows the new location for ISP 3 and the affected area of CSSA 2.

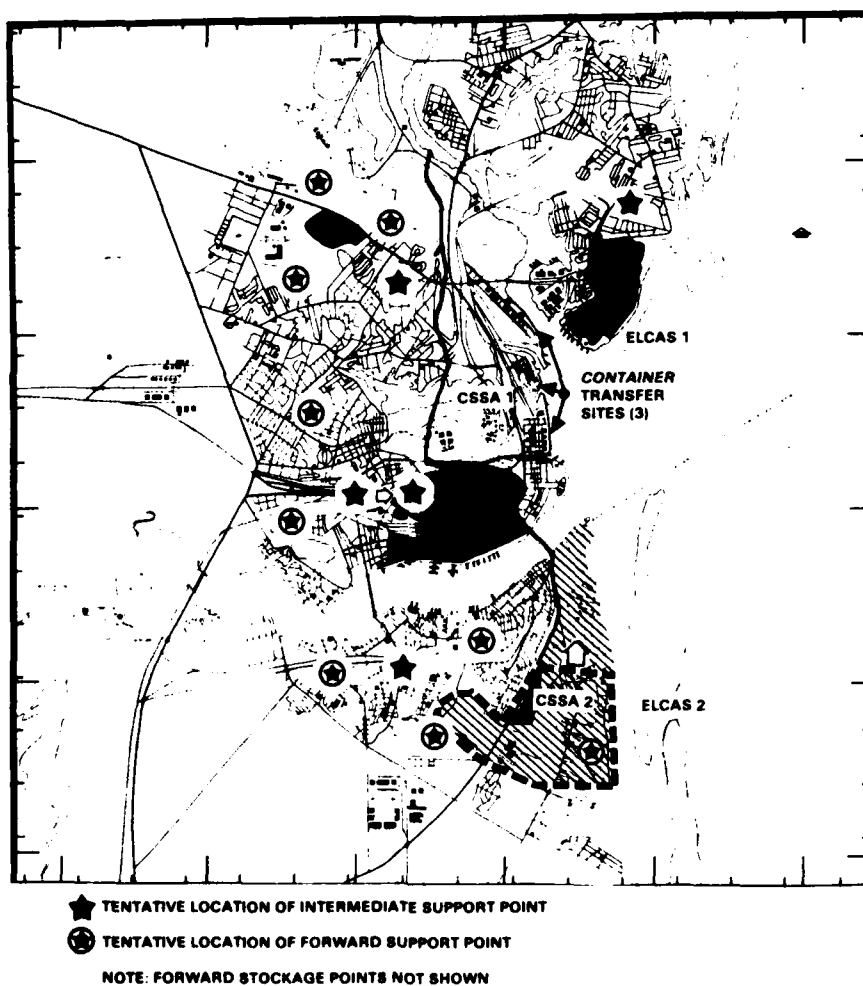


Figure III-14. Tentative Location of CSS Activities - Mobile Defense



## Concept of Operations - Current Time Frame

### MISSION 11 - DEFENSE OUTSIDE THE CITY

THIS CONCEPT MAY BE ADOPTED WHEN THE TERRAIN SURROUNDING AN URBAN AREA OFFERS ADVANTAGE TO THE DEFENDER AND THE MARINE CORPS LF IS OF SUFFICIENT STRENGTH TO ORGANIZE A DEFENSE OUTSIDE THE CITY. (USMC STUDY SCN 30-77-01)

### VII MAF Mission

VII MAF defends FBHL to protect the approaches to SYN City from infiltration and attack until follow-on forces are landed and deployed, a period estimated to be between D+30 and D+45; thereafter, be prepared to attack to the northwest.

### General Concept of Operations

Defense outside the city is based on maneuver warfare. The main avenues of approach are well-suited to mechanized warfare, while mechanized movement outside the corridors is restricted by marsh, microrelief, and forested areas. MAF elements assigned defensive sectors outside of SYN City proper must be provided with the means to remain mobile at the critical time and place. This mobility can be provided by an integrated use of assault amphibians, wheeled motor transport vehicles (5T 6x6), and/or transport helicopter assets.

Tank-heavy MCATFs will be established as the northern and southern GOP forces with the Reconnaissance Battalion tasked to screen the South River fault and adjacent densely wooded hill masses. GOP forces will receive priority helicopter support for maintaining observation posts, supporting deep reconnaissance, conducting artillery raids forward of the GOPL, conducting antiarmor missions, and providing combat service support to forward deployed units or units that are not accessible by wheeled transport vehicles. The GOP forces will engage the Aggressor at maximum range using offensive action and spoiling attacks to the greatest degree possible to stop the enemy advance or delay that advance by at least 48 hours after initial contact. GOP forces will be prepared to conduct aggressive, mobile delaying actions without becoming decisively engaged and to occupy reserve positions behind the FEBA from which they can launch major counterattacks against any penetrations of the FEBA.

Forces on the FEBA will defend in sector until their positions become untenable, at which time they will withdraw to alternate or supplementary positions to retain key terrain while permitting a penetration of the FEBA to occur. The mobile reserve, newly constituted from former GOP forces, will then counterattack the flank of the penetrating force to destroy or eject it.



Concept of Operations - Current Time Frame

Mission 11 - Defense Outside the City (Continued)

TABLE III-2. GOP FORCES - DEFENSE OUTSIDE

NORTHERN SECTOR GOP - 2ND TANK BN TASK FORCE

2nd Tank Battalion (-)  
2nd Battalion, 1st Marines (-)  
Co A (Rein), 1st AAV Battalion  
Co A (-) (Rein), 7th Cbt Engr Bn  
1st Plt, FAAD Battery  
155 mm (SP) GS Arty Bn (Rein) }  
Battery 105 mm (T) Artillery } Composite Artillery Battalion  
Det, FSSG (Maint, Supply, MT/MTV)

AFU, LAAM Bn, Direct Support

WESTERN SECTOR GOP SCREEN

7th Reconnaissance Battalion (-)

SOUTHERN SECTOR GOP - 1ST TANK BATTALION TASK FORCE

1st Tank Battalion (-)  
3rd Battalion, 2nd Marines (Attached to 3rd Marines)  
Co B (Rein), 1st AAV Battalion  
Co C (-) (Rein), 7th Cbt Engr Bn  
3rd Plt, FAAD Battery  
8" (SP) GS Arty Bn (Rein) }  
Battery 105 mm (T) Artillery } Composite Artillery Battalion  
Det, FSSG (Maint, Supply, MT/MTV)

Battery, LAAM Bn, DS

Note: Priority of helicopter support to GOP for scheduled and immediate requests.

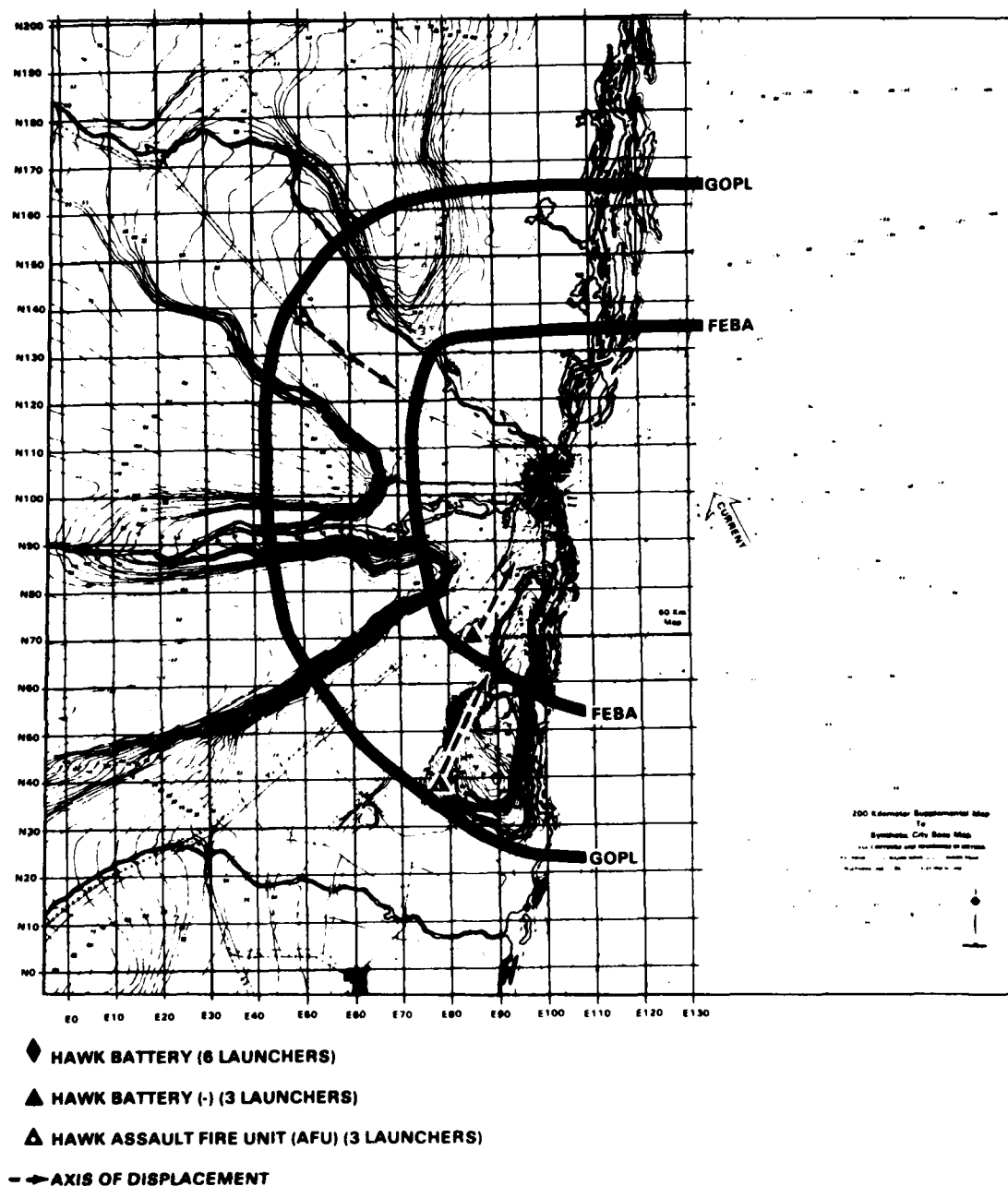


Figure III-16. VII MAF SAM Defense (Hawk) - Defense Outside the City

## Concept of Operations - Current Time Frame

### Mission 11 - Defense Outside the City (Continued)

#### Combat Service Support Concept

Combat service support will be provided from activities located at CSSAs established during the offensive phase (CSSAs 1 and 2), two forward CSSAs each located in suitable terrain approximately 15 km from SYN City, and HLZs located in proximity to the forward deployed units. Each of these logistic activities will have unique missions with respect to the broad spectrum of combat service support that must be provided.

CSSAs 1 and 2 will be the focal points for all cargo throughput operations as well as the interface between sea-based logistic support and the field logistic system. Large containers will be landed at ELCAS and directly at the port, container contents will be reconfigured based on the supported unit, and QUADCON-sized loads will be loaded onto appropriate vehicles for transport to the forward CSSAs. Although the bulk of the division is deployed near the FEBA, one reinforced infantry battalion and all fixed-wing assets (less V/STOL) remain within the SYN City metropolitan boundary. These units will be supported directly from the appropriate CSSA within SYN City.

Forward deployed CSSAs are located in suitable terrain approximately 15 km from CSSAs 1 and 2. The locations for these activities, sited initially based on a map reconnaissance, would be influenced by the availability of nearby primary roads for MSRs, local soil conditions conducive to the establishment of logistic activities within the CSSAs, and terrain which affords some measure of cover and concealment. These forward CSSAs will maintain a 10 DOS stockage of all supply classes while CSSAs 1 and 2 will maintain an equal stockage. The bulk of the combat service support required by the FEBA forces will be provided by these activities. Container operations will be limited to the reconfiguration and redistribution of QUADCON and PALCON-sized containers. These CSSAs will also support the operation of forward V/STOL facilities.

The final elements in the logistic support structure for the Defense Outside the City mission are HLZs supporting each of the forward battalions deployed along the FEBA and Mobile Combat Service Support Detachments (MCSSDs) supporting the MCATFs on the GOPL. Due to the overriding requirement for mobility in this defensive mission, a maximum level of a 3 DOS will be maintained at HLZs. MCSSDs will carry 3 DOS of Class I, III, and V items.

The logistic concept outlined above will utilize unit distribution so as to centralize motor transport assets and emphasize forward maintenance contact teams to the maximum degree possible. Containers are handled as far forward as is practicable with current equipment resources and supplies (20 DOS ashore) are dispersed amongst four major locations. Extensive use

will be made of transport helicopters (CH-53E preferred) to resupply MCSSDS and augment the ground transport capability from the forward CSSAs to the FEBA forces.

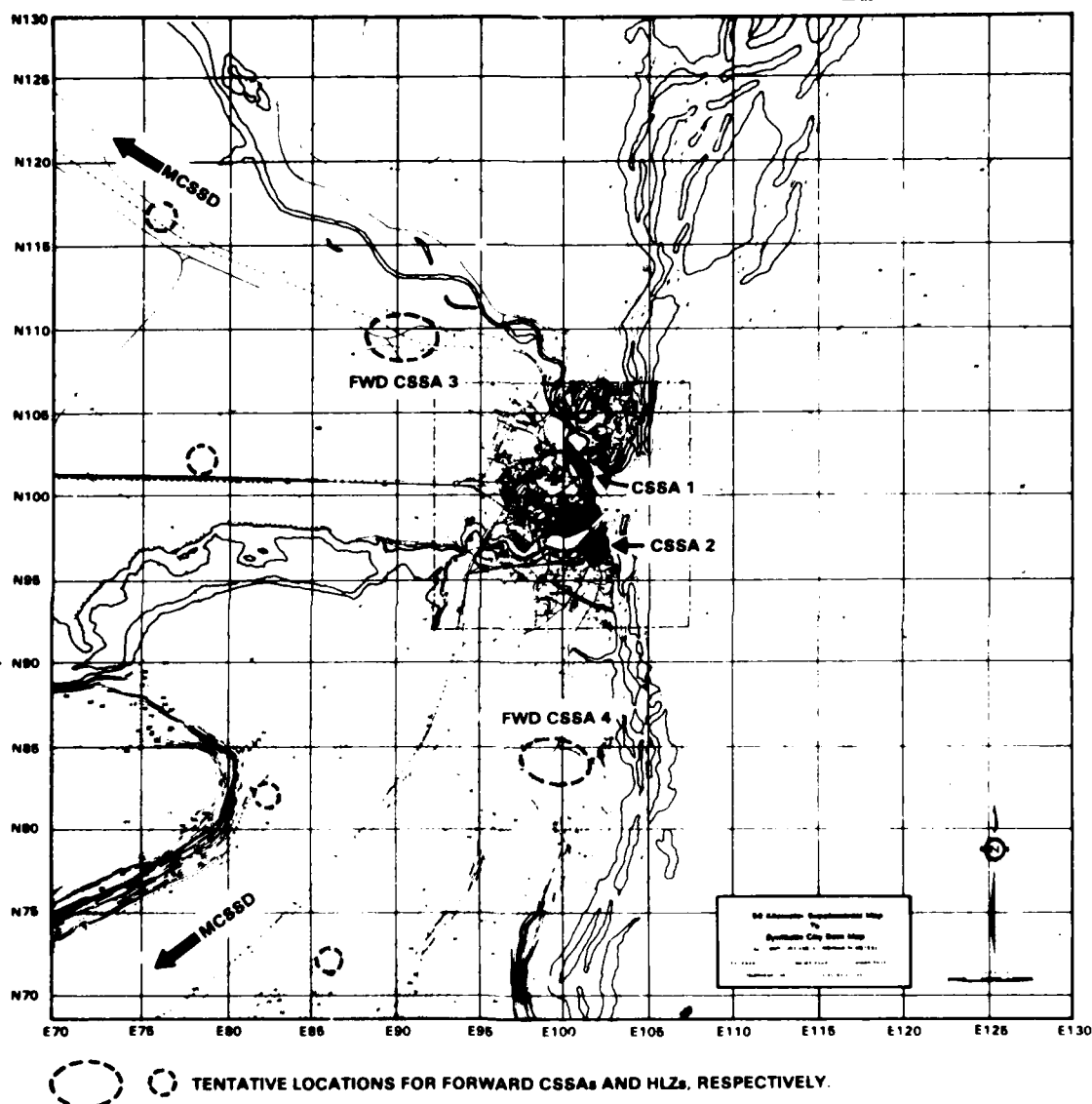


Figure III-17. Tentative Locations for CSS Activities - Defense Outside the City

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GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS  
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EDUCATION COMMAND QUANTICO VA DE. R J YEOMAN

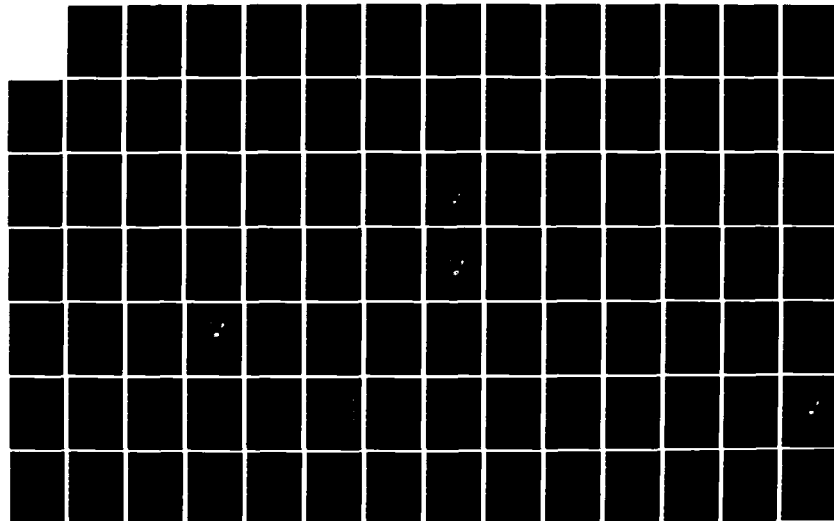
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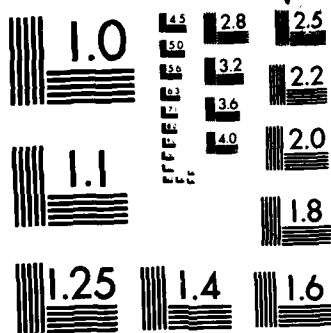
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MICROCOPY RESOLUTION TEST CHART  
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CHAPTER IV  
CONCEPT OF OPERATIONS -  
MID-RANGE TIME FRAME

## Concept of Operations - Mid-Range Time Frame

### INTRODUCTION

THE GENERAL AND SPECIAL SITUATIONS SET FORTH IN CHAPTER III FOR THE CURRENT TIME FRAME REMAIN THE SAME AND APPLY TO EACH OF THE SIX DEFENSIVE MISSIONS ASSIGNED VII MAF IN THE MID-RANGE PERIOD. CSS CONCEPTS REMAIN THE SAME BUT LEVELS OF SUPPORT MAY DIFFER DUE TO THE INTRODUCTION OF NEW COMBAT, COMBAT SUPPORT, AND COMBAT SERVICE SUPPORT EQUIPMENT ITEMS.

### Aggressor Capabilities

NBC Warfare. The Aggressor forces are exceptionally well-trained and equipped for operating in an NBC environment. If chemical warfare is initiated, they can be expected to use chemicals to contaminate logistical complexes, MSRs, and reserve formations. SCUD and FROG missiles with warheads containing persistent agents (to include VX, HD, BZ) can be fired on VII MAF airfields or command centers or used to seal off areas that Aggressor forces want to deny to US forces. Nonpersistent agents can be delivered by a variety of means to produce casualties, neutralize Aggressor objectives, or eliminate elements of the MAF antitank defense.

Armor. The Aggressor main battle tank is either the T-72 or T-80. Both mount a 125mm main gun with an automatic loading system and both shoot on the move. The T-80 is believed to have composite armor and greatly improved range-finding and target designation systems. Both MBTs have collective NBC defensive systems.

Night Operations. Aggressor forces are well-trained in night operations and are equipped with upgraded land navigation systems, night vision devices, and illumination. Their personnel within SYN City know the city layout and can also call upon local citizens to provide guides and other services needed in urban operations.

Radioelectronic Combat. Aggressor forces stress the use of REC to preserve and facilitate the use of their own command, control, and communications while denying the enemy the use of his. Aggressor REC capabilities, coupled with the constraining influences of combat in unfamiliar urban terrain will present significant problems for VII MAF.

Logistics. Aggressor forces in southern Aggressorland are well-supplied with dispersed, protected stockpiles of all classes of supply. The loss of the SYN City port will complicate the resupply of these committed divisions and a heavy emphasis will be placed on rail routes to move supplies.

Air Defense. Each of the Aggressor MRDs approaching SYN City has an organic SA-6 battalion, 16 SA-9 TELs, 16 ZSU 23-4s, and approximately 135 SA-7s (or their equivalent follow-ons) providing an effective air defense envelope. The Airborne Division has an organic AD battalion in addition to manportable SAMs organic to the regiments.

Air Forces. Aggressor aircraft can provide support in the SYN City area from airfields throughout Aggressorland. They can be expected to achieve local air parity, or superiority on occasion. See ANNEX B (intelligence) to Concept Plan 1-88 (Operation MID-BREAKER ONE) in Volume II of this study.

Naval Forces. Aggressor surface naval forces are either at sea or in defended ports to the north and south of SYN City. They can harass but not seriously interfere with the ATF as long as the operation remains conventional. Their mining capability is impressive and could require a major mine sweeping effort to support conventional follow-on surface-landed operations. Aggressor air cushion vehicles are capable of delivering raiders or amphibious counterattack forces from the sea against the FBH.

#### Friendly Capabilities

The overall capabilities of VII MAF are subject to change towards the mid-range time period with the possible reorganization of existing units and the fielding of new equipment items. Many of these items, if procured and fielded to USMC FMF units, will have a direct influence on the level of combat service support required in the defense of SYN City. Other items are one-for-one replacements not involving significant changes to current tactical and CSS concepts or support levels. Some of the equipment and organizational differences between the current and mid-range periods are noted below.

- Restructuring of USMC rifle battalions and subordinate elements. Introduction of new, manportable weapons and additional DRAGON and TOW elements into the battalion structure.
- Restructuring of the artillery regiment and introduction of the M198 155mm towed howitzer.
- Procurement and fielding of a light armored vehicle (LAV) as an integral part of a light armored vehicle battalion.
- Upgrading of rotary-wing assets, fielding of AV-8B aircraft, and replacement of F-4 aircraft with F-18s.
- Possible procurement and fielding of the M1 tank as the replacement for the current M60-series main battle tank (MBT).
- Procurement by the Navy of air cushion vehicles (i.e., LCAC) to replace displacement landing craft for the landing of troops, supplies, and equipment.
- Procurement of new motor transport and materials handling equipment compatible with container operations.

## Concept of Operations - Mid-Range Time Frame

### EQUIPMENT INTRODUCTIONS

THE INTRODUCTION OF LIGHT ARMORED VEHICLES, V/STOL ASSETS CAPABLE OF TRANSPORTING THESE VEHICLES, AND LCACs WILL PERMIT A GREATER VARIETY OF TACTICAL OPTIONS TO BE EMPLOYED BOTH IN THE MAF SECURITY ZONE AND IN THE FORWARD DEFENSE AREA OF SYN CITY.

All military services are in a constant state of change with respect to equipment inventories and task organization and the Marine Corps is no exception. Several substantial changes occurring late in the current time period or early into the mid-range period are expected to impact upon the tactical options available to CG VII MAF during the course of the SYN City defense. The changes that will be noted here involve equipment introductions and their associated impacts on the VII MAF structure. The principal equipment items expected to have the greatest impact upon the urban defense are the LAV (regardless of the prototype eventually procured), the M198 howitzer, the Landing Craft Air Cushion (LCAC), and the CH-53E helicopter. The contributions of each of these systems must be analyzed in relation to their impact on specific phases of the urban defense i.e., initial delaying actions forward of the FEBA or urban-only defense where all MAF units are deployed within the FEBA.

The systems noted above will have the greatest impact on defensive operations conducted outside the city. Although these actions occur in conventional terrain outside SYN City, the outcome of the overall urban battle may depend on the success of these operations. The LAV, referring to a generic light armored vehicle, will provide the division commander with additional flexibility when task-organizing mobile task forces (MCATFs) for a specific operation. Illustrative task force organizations were noted in Volume I pp. IV-4 and IV-5. The M198 howitzer will provide an increased artillery capability to these task forces by virtue of its longer range and greater munitions effectiveness. Both the LAV and the M198 howitzer are expected to be helicopter-transportable; the LAV will require CH-53E helicopter lift support. This transportability will permit multiple small but hard-hitting airmobile raids executed by LAVs and/or M198 howitzers. The LCAC will significantly increase the number of potential amphibious landing sites worldwide and can be used in the SYN City defensive scenario to insert small mobile task forces against the eastern flank of approaching Aggressor columns. In short, these mid-range systems will permit a greater overall flexibility to conduct aggressive delaying operations designed to attrite Aggressor armor and artillery, force early deployment of tactical units, disrupt rear area operations, and gain time for VII MAF(-) to adequately prepare SYN City for the eventual arrival of the Aggressor.

The impact of the LAV, M198 howitzer, CH-53E helicopter, and LCAC upon tactical concepts is not as pronounced within the actual urban environment. Once GOP MCATFs have withdrawn inside the FEBA and Aggressor forces have

effectively contained VII MAF within the city, all combat units organic to 7th Mar Div will be heavily committed in the Forward Defense Area. Opportunities for helicopter or LCAC insertions of small raiding parties will decrease as Aggressor antiair and antilanding defenses are established in the immediate vicinity of SYN City. In this situation, the LCAC will be used principally in a logistic role to transport supplies into the FBH. The utility of the CH-53E helicopter within the city is not diminished; there will be a continuing requirement for salvage operations and equipment redeployments, but the primary mode of transport will be by ground means vice V/STOL assets.

The LAV elements organic to 7th Mar Div will be used to augment reserve strike forces poised near likely penetration zones. The greater mobility of the LAV within the city, as compared with tanks and LVTs, should permit a greater range of offensive action in local areas. The LAV Battalion will provide additional firepower for mobile reserves, fire support for dismounted infantry, and a potential armored logistics capability in addition to that provided by other armored vehicles. The main armament for the LAV, undecided as of this time, is expected to provide an increased capability for building penetration as compared with current .50 cal or 7.62 mm machineguns.

The M198 howitzer will be firing predominately outside the city against Aggressor artillery, CSS areas, and advancing combat elements. The increased range and effectiveness of this howitzer will increase the capability to attack long-range targets with fewer rounds. In a direct-fire role within the city, the M198 howitzer would have a greater effect against hardened positions but the vulnerability of the crew and the system itself to suppressive fires may preclude (or severely diminish) its use in this role. Self-propelled howitzers have a greater overall utility within this environment.

Other mid-range hardware introductions may influence tactical concepts to a lesser degree.

- SMAW - This "bunker buster" is sorely needed in urban combat. The availability and use of this system will reduce reliance upon combat engineers and provide an effective wall-breacher organic to infantry units.
- MK19 40 mm Machinegun - This weapon will be especially effective in the suburban areas of the city provided that sufficient arming distance is available.
- SAW - This weapon will provide additional firepower for the infantry fire team. Fewer fire teams may be required to provide the same relative level of firepower - a smaller force defending the same terrain area.

## Concept of Operations - Mid-Range Time Frame

### COMBAT SERVICE SUPPORT

COMBAT SERVICE SUPPORT DURING THE MID-RANGE PERIOD WILL BE INFLUENCED BY THE FIELDING OF NEW EQUIPMENT ITEMS AND THE CORRESPONDING CHANGES WITHIN THE MAF ORGANIZATIONAL STRUCTURE.

This section will deal with the general combat service support impact of those equipment items whose introduction is anticipated before or during the mid-range time period. The full impact of many of these items has not been quantified with respect to the range of combat service support functions in a conventional environment, much less an urban environment. The primary purpose of this section is to highlight equipment item/CSS function combinations with the greatest potential impact. In-depth studies will be required to fully quantify the overall impact upon a MAF CSS structure.

The table opposite shows the potential CSS impact of many items anticipated to be in USMC inventories by the end of the mid-range period. (This listing is not all-inclusive.) The new generation of armored vehicles will have the greatest impact on CSS function by virtue of their increased requirements for fuel, ammunition handling and transport, embarkation, maintenance, and maintenance training. The Amphibious Logistics System (ALS) and the LCAC will revolutionize the manner in which equipment and supplies are brought into the FBH. New man-portable weapons will increase requirements in all of the CSS functions noted with the exception of engineer CSS. It is anticipated that new or improved aviation assets will require less overall maintenance than the aircraft they replace. The CH-53E should be able to carry loads up to 16 tons thereby providing tactical and logistic planners additional flexibility for the movement of equipment and supplies. The urban defensive impact of these items will require that additional CSS equipment and personnel resources be provided during the embarkation phase, assault phase, and defensive phase of the overall SYN City operation.

The basic combat service support concepts discussed in Chapter III are thought to be equally valid during the mid-range period. Missions to defend within the metropolitan area should be logistically supported by dispersed CSS activities designed to be more survivable and mutually supporting than that support provided by one or two large CSSAs. The Defense Outside the City mission will require forward deployed CSSAs in addition to those within the city accomplishing the interface with external logistic support. The tentative locations of all CSS activities should remain basically the same as in the current time frame.

TABLE IV-1. CSS IMPACT OF MID-RANGE EQUIPMENT INTRODUCTIONS

ITEM	COMBAT SERVICE SUPPORT IMPACT (MAF)						
	ENGR	MHE	EMBARK	SUPPLY	TRANS	MAINT	CSS TNG
M1	++ <sup>1</sup>	+	+	+	+	++	++
LAV	++ <sup>1</sup>	+	++	+	+	++	+
MPGS	+ <sup>1</sup>	+	++	+	+	++	+
LCAC	N	N	++	N	*	N	N
CH-53E	N	N	N	N	*	-	N
AV-8B	N	N	N	N	N	-	N
F/A-18	N	N	N	N	N	-	N
MT	N	N	+	N	*	N	N
MHE	N	*	+	N	N	N	+
M198	N	+	N	+	+	N	N
SMAW	N	+	+	+	+	+	+
MK19	N	+	+	+	+	+	+
SAW (NOTE 8)	N	N	N	N	N	+	+
M16A1 PIP	N	N	N	N	N	-	N
VIPER (NOTE 9)	N	N	N	N	N	N	N
STINGER	N	N	N	N	N	N	N
COMM EQUIP	N	N	N	N	N	+	+
ALS	+++ <sup>2</sup>	++	++	N	+++	+	+
		Note 3	Note 4	Note 5		Note 6	Note 7

Key: +(-) Slightly increased (decreased) requirement - minor impact  
 ++(-- ) Moderately increased (decreased) requirement - moderate impact  
 +++(---) Greatly increased (decreased) requirement - major impact  
 N Insignificant impact  
 \* Item directly related to CSS function - major impact

Note 1 Increased bulk fuel requirement.  
 2 Increased PHIBCB requirement for ALS installation.  
 3 Most increases (except ALS) due to additional Class V handling.  
 4 Additional square and cube requirements.  
 5 Increases due to additional or new Class V or IX items.  
 6 New maintenance procedures for new items.  
 7 CSS Tng to accomplish new maintenance procedures.  
 8 Includes effects of M60 deletions in divisional unit T0&Es.  
 9 VIPER and STINGER are essentially one-for-one replacements for LAW and REDEYE.

CHAPTER V

COMBAT SERVICE SUPPORT FUNCTIONS AND REQUIREMENTS



## Combat Service Support Functions and Requirements

### ENGINEER MOBILITY ENHANCEMENT

THE PRINCIPAL ENGINEER MOBILITY ENHANCEMENT REQUIRED DURING AN INNER-CITY DEFENSE WILL BE TO CLEAR RUBBLE FROM RESUPPLY ROUTES AND KEY STREETS WITHIN THE FORWARD DEFENSE AREA. SCOOP LOADERS AND HEAVY DOZERS SHOULD BE ATTACHED TO FORWARD COMBAT ENGINEER ELEMENTS TO HANDLE THIS EVENTUALITY.

Mobility enhancement requirements change significantly as VII MAF assumes a defensive posture within SYN City. Many mobility functions will already have been accomplished during the offensive period and other tasks will be accomplished by engineers providing combat service support. The Aggressor capability to emplace standard obstacles within the defended city is limited but the creation of rubble will pose a major problem if not quickly cleared from key resupply and counterattack routes within dense built-up areas of the city.

The many and varied engineer tasks associated with mobility enhancement in a conventional environment include:

- |                        |                    |
|------------------------|--------------------|
| ● Beach preparation    | ● Bridge repair    |
| ● Obstacle breaching   | ● Pioneer bridging |
| ● Road repair          | ● HLZ construction |
| ● Bridging and rafting | ● EAF construction |

The majority of beach preparation and critical road repair tasks will have been accomplished by D+11 by combat engineers providing expedients or general support engineers providing facilities maintenance support. Since the destruction of any major bridge spans could necessitate rafting or ferry operations, many minor bridge repairs would also have been accomplished by FSSG engineers prior to the shift to a defensive posture. Requirements for pioneer bridging were judged to be minimal during the offensive phase and will not constitute a significant requirement in the defense. HLZ and EAF construction requirements are significantly reduced as VII MAF assumes a defensive posture within the city. (See Engineer CSS-Horizontal Construction pg. V-16) These tasks will be addressed in greater detail as an engineer combat service support function. Of all the tasks noted above, obstacle breaching within the city and rafting operations across the North and South Rivers will be continuing requirements during defensive operations.

Once VII MAF has deployed divisional assets in the forward defense area and fortified the FEBA, the Aggressor capability to emplace effective obstacles within the MAF defensive zone will be severely limited unless Aggressor units effect deep penetrations and consolidate city areas. The principal obstacle type to be countered will be rubble caused by direct and indirect fires from tanks and large artillery weapons. While most of the munitions employed will tend to blow debris inward, massed artillery fires

and effective direct fires will eventually produce rubble on the streets and degrade wheeled mobility through these areas. The Engr Supt Co Cbt Engr Bn should be prepared to provide engineer equipment in direct support to each of the engineer companies in regimental sectors of responsibility.

The rafting and bridging problem noted during the offense continues to be a problem during the defense of SYN City. River widths are such that construction of float bridges across either of the rivers is not possible if one bridge set is earmarked for installation at the inshore channel near Blue Beach. Using all three M4T6 bridges organic to the MAF would provide one bridge across North River. It is recommended that all available M4T6 bridge assets available be configured as Class 60 rafts and prepositioned near Bridge 1 to ensure that this LOC is kept open. Displacement landing craft should be pressed into service as ferries as soon as irreparable damage is sustained by any of the major SYN City bridges. (LCACs and powered causeways are fully required to provide supply shuttle service between the Sea Echelon and CSSAs.) The South River is the most crucial area as almost one-third of VII MAF is deployed south of that river.

The SYN City operation is plagued by the presence of two wide rivers that trisect the metropolitan area. No ford sites are available within the city proper and each of the major bridges is vulnerable to interdiction. The extensive use of float bridge rafts and other ferry expedients is required in such a case to maintain the tempo of logistic operations and tactical redeployments. Other port cities in the world will have rivers of different military characteristics perhaps necessitating a different mix of bridging support. The one inescapable fact in all cases is that the intact capture and rapid repair of all major bridges is vital since the MAF does not have the capability to replace lengthy bridge spans made unusable by combat action.

#### PRINCIPAL MOBILITY ENHANCEMENTS DURING SYN CITY DEFENSE

- RUBBLE CLEARANCE - PREPOSITION ENGINEER EQUIPMENT FORWARD.
- FLOAT BRIDGING - FOUR CLASS 60 RAFTS PLUS DISPLACEMENT LANDING CRAFT AVAILABLE IN EVENT OF MAJOR BRIDGE FAILURE.

## Combat Service Support Functions and Requirements

### ENGINEER COUNTERMOBILITY ENHANCEMENT

THE INSTALLATION OF INTEGRATED AND EFFECTIVE BARRIERS AND OBSTACLES WILL SLOW THE AGGRESSOR ADVANCE, FORCE EARLY DEPLOYMENT, CANALIZE ASSAULT FORCES INTO PREPARED KILL ZONES, AND INFLICT VEHICLE AND PERSONNEL CASUALTIES. ENGINEER COUNTERMOBILITY TASKS, CLASSIFIED AS COMBAT SUPPORT VICE CSS, WILL REQUIRE ALL AVAILABLE ENGINEER RESOURCES FROM D+11 THROUGH D+16.

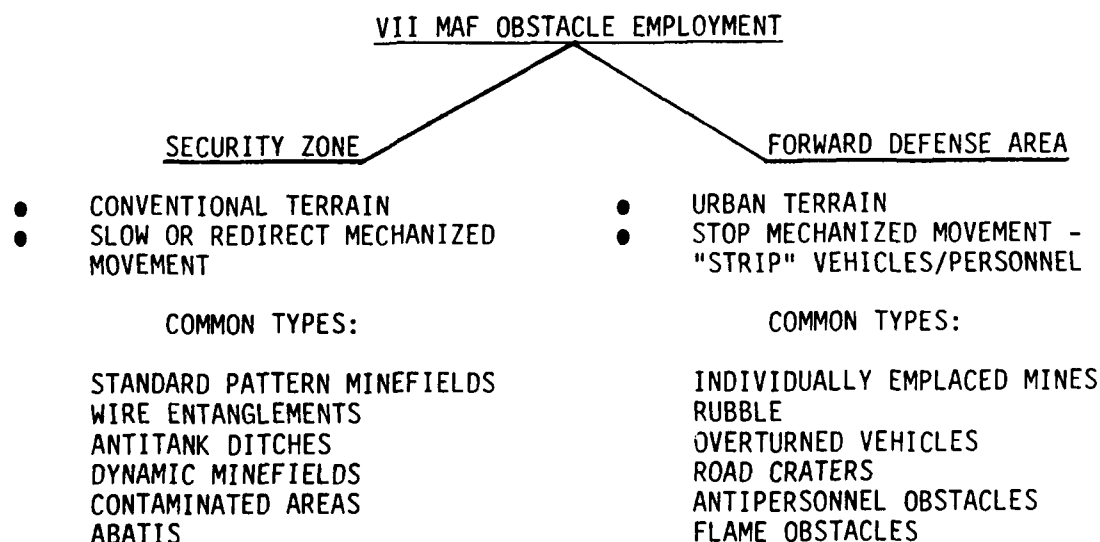
During the amphibious assault and subsequent consolidation of SYN City, combat engineers supported by other divisional personnel installed hasty obstacles along the flanks of approach corridors and provided technical expertise to forward units for the siting and installation of protective minefields. The countermobility requirement and associated engineer workload was not significant in terms of the total engineering requirement and mount-out quantities of Class IV and V items were judged by analysts to be marginally adequate to support the installations of these obstacles. The situation is totally reversed as VII MAF shifts to a defensive posture within the city and neither sufficient materials nor personnel are available to execute extensive outer and inner barrier plans.

When VII MAF received the mission to defend SYN City and elected to defend from within the city, the Aggressor divisions constituting the committed forces were 150 km distant from the city. BDM analysts projected the arrival at the FEBA of Aggressor advance elements by D+16 with several days time being gained by aggressive offensive action in the security zone by GOP forces consisting of two MCATFs. Although an urban area in itself degrades mechanized mobility, the installation of effective barriers was seen as the key to a successful urban defense. Unfortunately, only five days are available to redeploy units, increase supply stockage levels, and install barrier obstacles outside and within the city. The following paragraphs will outline the magnitude of the problem from both a logistic and a manpower perspective. An in-depth analysis of engineer combat support requirements is beyond the scope of this study but the problem so dominates the engineering picture that engineer CSS resources must be diverted to accomplish the required tasks in the time available.

The construction of barriers and obstacles must complement the defensive scheme of maneuver and existing obstacles whether natural or man-made. While Mission 6-Defense Inside the City, implies that the bulk of VII MAF defenses will be sited within the city itself, the aggressive delaying action by GOP MCATFs will be materially enhanced by well-sited obstacles in the MAF security zone. These obstacles will be sited in conventional terrain and consist of minefields, antitank ditches, abatis, road craters, and wire entanglements. The primary purpose of these obstacles is to delay or redirect the movement of mechanized vehicles into terrain compartments more favorable to the GOP MCATFs.

The second grouping of obstacles is sited within the urban area with the purpose of stopping all mechanized advances, forcing personnel to dismount their vehicles, and causing casualties among the dismounted troops. These inner-city obstacles are also sited in conjunction with the urban terrain consisting of structures, streets, and small open areas. The obstacle type and density depends on the defensive plan as well as the mobility degradation caused by the existing facilities and structures.

The urban area provides many opportunities for the use of expedient but effective obstacles. This particular type of terrain may be viewed as a combat engineer's paradise with respect to the countermobility opportunities that may be exploited through the use of ingenious obstacles. Given enough lead time, personnel, and barrier supplies an urban area may be made virtually impenetrable to ground assault. The use of key thoroughfares may be denied by a small number of well-placed mines. Building entrances, passageways, and interior rooms may be denied by a number of methods including antipersonnel mines, wire entanglements, and boobytraps. Demolitions may be used to rubble entire buildings and flame fuel expedients may be used to canalize enemy advances and increase the psychological tension within the attacker.



## Combat Service Support Functions and Requirements

### Engineer Countermobility Enhancement (Continued)

#### Security Zone Countermobility

Barriers and obstacles constructed in the conventional terrain of the security zone are intended to canalize the mechanized enemy into kill zones prepared by GOP MCATFs. Although the combat actions envisioned as occurring in the security zone from D+11 through D+16 will be characterized by fluid engagements over a wide battlefield, this battlefield may be made smaller and more favorable to the defending force by well-sited obstacles and barriers. The SYN City data base contains no specific information concerning the terrain outside the metropolitan boundary; the following analysis and discussion is based on the use of general planning factors for countermobility requirements in terrain offering moderate movement possibilities. These planning factors can be found in FM 101-10-1 (July 1976) Table 6-38. Further, it is assumed that MAF elements have not constructed or executed any significant portions of the overall defensive barrier plan prior to D+11--a "standing start" situation.

Each of the two approach corridors contains approximately 600 sq km of maneuver area for a total of 1,200 sq km. If the terrain in this area presented moderate movement to the advancing force then, under average circumstances, obstacle and barrier requirements in terms of manpower and materiel are shown in the table opposite. This level of battlefield preparation clearly is not within VII MAF capabilities to accomplish within a five-day period given competing demands for survivability enhancement measures and obstacle construction within the city. In order to levy realistic requirements on engineer and transportation assets while at the same time providing effective barriers complementing MCATF schemes of maneuver, analysts estimated that 25 percent of the total would represent the minimum acceptable level of obstacles forward of the FEBA, consistent with the resources available. See note at bottom of Table V-1.

Manpower and timing considerations necessary to realize 1200 platoon hours of effort are as follows:

D+10: Receive order, move men and initial materials to worksites

D+11 } { 3 Inf Bn (-Wpns Cos/ Plts) + 4 Cbt Engr Plt ➤ 40 Plt

D+12 } { 2 Shifts @ 20 Plt x 10 hrs/shift x 3 days = > 1200 Plt hrs

D+13 }

D+14: Delay back to Forward Defense Area

D+15: Finish FDA preparations, meet Aggressor arrival

The key to the manpower problem is the availability of those infantry personnel, all of whom would require a minimum level of pretraining in the areas of mine installation and wire entanglement construction. (NCR assets are fully required to rehabilitate transport interfaces and install obstacles within the Forward Defense Area.)

The transportation requirement to move 1,366 ST of material in three days would involve twenty 5T cargo vehicles each making five six-ton trips per day for 3 days (at 80 percent availability). A materials handling capability is required at each end of the trip. Assuming that each one-ton lift requires ten minutes then six rough terrain forklifts should be dedicated for this operation at each of the terminal points.

TABLE V-1. OBSTACLE REQUIREMENTS IN SECURITY ZONE (1,200 SQ KM)

<u>OBSTACLE CATEGORY</u>	<u>OBSTACLE TYPE</u>	<u>UNITS</u>	<u>QUANTITY @ 100%</u>	<u>QUANTITY @ 25%</u>
Minefield	Barrier	Km	23.4	5.9
	Defensive	Km	12.0	3.0
	Protective	Km	0.6	0.2
Nuisance	Harassing	Sq Km	165.0	41.3
	Facility Denial	Ea	255.0	63.8
	Route Mining	Km	105.0	26.3
General	Hwy Bridge	Ea	105.0	26.3
	RR Bridge	Ea	9.0	2.3
	Tunnels	Ea	----	----
	Abatis	Ea	45.0	11.3
	Road Craters	Ea	204.0	51.0
Barbed Wire	Double Ap (2&4)	Km	75.0	18.8
	4 Strand Prot	Km	30.0	7.5
	3S Concert	Km	19.5	4.9

<u>MATERIEL TYPE</u>	<u>U/I</u>	<u>QUANTITY @ 100%</u>	<u>QUANTITY @ 25%</u>
Mine AT	Ea	133,434	33,359
AP (Frag)	Ea	281,742	70,436
AP (Blast)	Ea	461,460	115,365
Firing Device	Ea	38,532	9,633
Trip Flares	Ea	9,825	2,456
Explosive	Lb	281,400	70,350
Barbed Wire	Reel	3,519	880
Concertina	Ea	3,843	961
SHORT-TONS		5,461	1,366
MEAS-TONS		5,844	1,461
PLT HOURS (30 Men)		4,800	1,200

Note: Following an initial reconnaissance of the MAF Security Zone, it is possible that some priority would be assigned to completion of certain obstacles before others. In the absence of detailed terrain information for this area, a straight 25% of the normal planning factor has been used for illustrative purposes.

## Combat Service Support Functions and Requirements

### Engineer Countermobility Enhancement (Continued)

#### Forward Defense Area Countermobility

The forward defense area is defined in this situation to be that area of SYN City contained within the FEBA in which divisional elements are deployed and in which the urban defensive battle will be won or lost. Once the Aggressor has succeeded in penetrating the security zone and after the GOP MCATFs have been withdrawn to counterattack positions within the FEBA, the purpose of obstacles in the forward defense area is to blunt the mechanized advance and strip personnel from their vehicles. Further, the obstacles should slow the rate of advance and deny areas and/or defensible positions to the attacker.

As was the case with the area outside SYN City, the SYN City Data Base does not provide detailed information concerning building types, methods of individual building construction, or building densities. The engineer planner would normally have this information when planning for the defense of a particular area. The following parameters were extracted or inferred from information depicted on the SYN City Base Map:

- FEBA Frontage - Northern peninsula-3.25 km; central front - 11.25 km; southern sector - 8.5 km; total 23.0 km.
- Ingress Roads - Northern peninsula - 8, central front -25 km; southern sector - 15 km; total - 48 km.
- Frontage Density - 25 percent "Open" - easy movement.
  - 50 percent "Restricted" - difficult to impossible movement.
  - 25 percent "Semi-Open" - moderate to difficult movement.

The frontage density refers to the density of vertical structures as it impacts on mounted and dismounted movement. This type of information would be readily available from aerial photography.

Obstacle requirements were estimated for each defensive area of the FEBA frontage for each frontage density category. The greatest requirement for obstacles occurred in the "open" areas while the "restricted" areas required less resources to fortify. The table opposite provides a breakdown on obstacle employment along the FEBA. The obstacle composition along intermediate defensive lines would remain relatively the same, although resource requirements should decrease due to a decreasing frontage.

Manpower requirements total 42,904 man-hours or 2,384 18-hour man days. If the obstacles were installed in 3 days then approximately 795 personnel are required--roughly equivalent to one combat engineer company plus three rifle companies plus one NMCB providing additional engineer personnel and equipment operators.

TABLE V-2. OBSTACLE REQUIREMENTS IN FORWARD DEFENSE AREA

	NORTH PENINSULA			CENTRAL FRONT			SOUTHERN SECTOR		
	OBSTACLE QUANTITY	MAN HOURS	SHORT TONS	OBSTACLE QUANTITY	MAN HOURS	SHORT TONS	OBSTACLE QUANTITY	MAN HOURS	SHORT TONS
TOTAL FRONTAGE (KM)	3.25	6,354	258.5	11.25	21,005	889.6	6.5	15,545	666.4
"OPEN" FRONTAGE (KM)	.81	2,995	141.9	2.81	10,401	492.8	2.13	7,895	373.9
STAND PATTERN MINEFIELD (KM)	.81	2,616	121.9	2.81	9,076	422.9	2.13	6,880	320.6
AT DITCH-EXPL (M)	200	219	6.0	700	765	21.0	540	590	16.2
35 CONCERTINA (KM)	1.6	160	14.0	5.6	560	48.9	4.25	425	37.1
"SEMI-OPEN" FRONTAGE (KM)	.81	2,093	78.8	2.81	7,056	269.5	2.13	5,125	201.6
STAND PATTERN MINEFIELD (KM)	.40	1,116	45.8	1.4	3,906	160.2	1.1	3,069	125.8
OFF-ROUTE AT MINE (EA)	48	16	1.0	168	56	3.4	126	42	2.5
AT DITCH-EXPL (M)	125	137	3.8	420	459	12.6	315	344	9.5
CRATER (EA)	24	240	6.6	75	750	20.6	45	450	12.4
35 CONCERTINA (KM)	1.6	160	14.0	5.6	560	48.9	4.25	425	37.1
FOUGASSE (FA)	32	64	5.6	100	200	17.5	60	120	10.5
AUTO CRIB (EA)	16	160	0.8	50	500	2.5	30	300	1.5
OVERTURNED RR CAR (EA)	8	120	0.4	25	375	1.3	15	225	0.8
RUBBLE (EA)	8	80	0.8	25	250	2.5	15	150	1.5
"RESTRICTED" FRONTAGE (KM)	1.63	1,266	37.8	5.63	3,548	127.3	4.24	2,525	90.9
AT MINE (EA)	163	41	4.1	563	141	14.1	424	106	10.6
AP MINE (EA)	1630	204	9.8	5630	704	33.8	4240	530	25.4
OFF-ROUTE AT MINE (EA)	65	22	1.3	225	75	4.5	170	57	3.4
AT DITCH-EXCAV (M)	160	286	-	560	1,002	-	420	751	-
CRATER (EA)	24	240	6.6	75	75	20.6	45	45	12.4
CONCERTINA (KM)	1.6	160	11.2	5.6	560	39.1	4.2	420	29.7
BOOBY TRAPS (EA)	32	41	0.4	104	141	1.4	212	106	1.1
FOUGASSE (EA)	16	6	0.4	50	100	8.8	30	60	5.3
AUTO CRIB (EA)	16	160	0.4	50	500	2.5	30	300	1.5
RUBBLE (EA)	8	80	0.8	25	250	2.5	15	150	1.5

TOTAL MAN-HOURS - 42,904

TOTAL SHORT TONS - 1,814.5



## Combat Service Support Functions and Requirements

### ENGINEER SURVIVABILITY ENHANCEMENT

COMBAT ENGINEERS WILL BE TASKED TO PROVIDE ASSISTANCE WITH THE PREPARATION OF BATTLE POSITIONS, DECONTAMINATION SUMP PITS, AND CAMOUFLAGE/DECEPTION OPERATIONS. DEFENSIVE URBAN COMBAT MAY TEND TO DECREASE THE OVERALL ENGINEER REQUIREMENT IN THIS AREA DUE TO THE POTENTIAL AVAILABILITY OF WELL-CONSTRUCTED STRUCTURES AND DRAINAGE SYSTEMS.

Engineer units, by virtue of their physical resources and expertise, have traditionally been tasked to increase the overall survivability of a defensive force by preparing sturdy battle positions able to withstand the pounding by heavy weapons. Considering the effects of modern weapons, very few fortified positions are impervious to such weapons as large caliber artillery pieces firing in the direct fire mode and "bunker-busting" rockets. However, a modern urban area provides the best terrain on which to base a static defense. Heavy fortifications (i.e., reinforced concrete buildings) are usually available throughout the city and offer multiple firing positions in three dimensions. With suitable preparation, these buildings provide the dismounted soldier an excellent level of cover and concealment.

The figure opposite provides an estimate of the number of forward battle positions occupied by VII MAF and the resources required to enhance the survivability of each battle position. Engineer units will be tasked to accomplish selected tasks at each battle position. The total engineer labor for 1,739 FEBA positions equals 5,652 man-hours or six engineer platoons working 10 hour shifts each day for three days. Sand will be obtained at the beach areas and transported by dump truck to each of the fortified building locations. Other labor will be provided by the combat unit occupying the battle position with the assistance of one NMCB.

Combat engineer units will also be tasked to prepare sump pits and associated expedient drainage facilities for decontamination operations. Decontamination facilities should be decentralized to available shallow slope open areas and provided with drainage and water sources. Contaminated runoff should be channeled into these pits or into closed underground cavities where it will not present a health problem to the populace. Engineer equipment resources (dozer, backhoe) are judged satisfactory to accomplish this function.

Engineers are normally tasked to provide assistance with camouflage and deception operations and an urban defense is no exception. One of the problems inherent in an urban environment is that of finding suitable camouflaging materials other than tarpaulins and rubble. The camouflaging problem may be alleviated by establishing defensive positions and storing selected supplies within structures where they will be out of sight. Other urban expedients include appropriately colored paints which may be sprayed according to the coloration of surrounding objects.

Assume: 23 Rifle Companies Occupying Primary Battle Positions (Strongpoints)  
 @ 1 Building/Platoon, 1 Floor/Sqd, 1 Room/Fire Team

Primary Positions - 621 Fire Team Positions

Secondary Positions - Same as Primary

Alternate Positions - .8 x Primary

Total Fire Team Positions Prepared - 1739

<u>Each Fire Team Position</u>	<u>Man Hours</u>	<u>Resources</u>
Remove Flammables	.5	None
Cut Firing Embrasure*	1.0	Hole breachers
Improve Room Ventilation*	.75	Sledgehammer/Flex Charge
Install Wire Mesh*	.5	Ramset, Cyclone fencing
Fill, Move & Place Sandbags	8.0	E-tools, shovels, sand
Camouflage Position	.5	Spray paint, rubble
Prepare Ingress/Egress Routes*	1.0	Hole breachers

\* May Require Engineer Assistance

SAND - 160 bags/room    ► 3865 CY plus sand on floor (for firefighting)  
                                   ► 600 M51A2 loads  
                                   \* Equivalent of 4 Co working 10-hour shifts for  
                                   3 days

Figure V-1. Battle Position Enhancement Requirements

## Combat Service Support Functions and Requirements

### GENERAL ENGINEERING

THE COMBAT ENGINEER BATTALION WILL BE TASKED TO PROVIDE GENERAL ENGINEERING SUPPORT AND SERVICES FOR DIVISIONAL AND OTHER DESIGNATED GROUND COMBAT ELEMENTS OF VII MAF. PRINCIPAL TASKS WILL BE THE PROVISION OF ESSENTIAL UTILITIES AND HYGIENIC SERVICES. INDIGENOUS FACILITIES WILL BE USED WHENEVER PRACTICAL.

Divisional engineers will be tasked to provide water and hygienic services to 7th MarDiv and other designated elements within the Forward Defense Area, mobile electric power for the division CP, and Level II electrical support to other divisional elements. Of key importance to engineer planners is the continuous performance of indigenous utility systems. Although the assets organic to the Combat Engineer Battalion are adequate to provide the required utility services to 7th MarDiv in the absence of any indigenous systems, the cessation of indigenous utilities would increase the Military Police and Civil Affairs requirements as well as increase the potential for health epidemics. Furthermore, a parasitic interface (water, hygiene) would reduce engineer requirements and enable these personnel to be diverted to other functions. Electric power will be provided by military equipment unless it is determined that the two systems will interface properly with respect to voltage and phasing. The suitability and extent of any such parasitic utility interfaces will be determined by the Public Works and Utilities Team (WB) augmenting the 4th Civil Affairs Group.

Utilities planning should proceed under the assumption that all indigenous utility services (water, electric, sewerage) will be denied or irreparably damaged during the early stages of defensive combat within SYN City. The water treatment plant and hydroelectric plant lie outside the SYN City metropolitan boundary. Their early capture is certain if Aggressor forces succeed in forcing GOP MCATFs to withdraw inside the city. Sewage treatment facilities and the coal-fired electric plant are all within two kilometers of the metropolitan boundary and situated in likely approach corridors and penetration zones. Denial of their services by capture or combat damage is certain if the Aggressor forces elect to deny utility services on a comprehensive or selective basis. Each of the utility functions will be addressed with the view that service will be interrupted during the course of the defensive period.

Electric power for 7th MarDiv will be provided by the Cbt Engr Supt Co Cbt Engr Bn for those units or elements requiring external MEP support. MEP support requirements during an urban defense are not expected to change significantly from those in a conventional environment. Unit commanders will continue to stress noise and light discipline and curtail the unnecessary use of electrical equipment. Generating equipment will generally be sited outside structures to lower noise and exhaust levels in the working environment. The generator itself should be provided ballistic protection and camouflage. Generator noise levels may tend to be a problem until more silent equipment is fielded. Electrical distribution networks may include elements of the indigenous system provided that the sections are electrically isolated from the remaining system. The requirement for heavy gauge distribution cable is expected to increase in an urban environment

where large users may be dispersed horizontally and vertically within a single large building or complex.

Divisional water requirements have been estimated based on the methodology and data contained within FM 5-700, Field Water Supply. The long-term goal is to provide water sufficient for a temporary camp with limited bathing facilities (individuals @10 gal/man/day). The minimum quantity has been set at 3 gal/man/day, and facilities demand in either case is 48,000 gallons (12 M121 decon apparatus @ 4,000 gal). This information is summarized in Table V-6 along with explanatory notes. It should be noted that the total potable water production capability of the division, as well as the MAF, far exceeds the potable requirement. The water analysis indicates that while VII MAF can produce sufficient quantities of potable water for itself as well as the populace, the total water requirement cannot be entirely met by potable production. Water for selected uses should be free from biological and chemical contamination but need not be potable. Water points should be dispersed at fresh water sources with storage and distribution by organizational equipment or functioning segments of the indigenous system.

Hygienic services normally include bath and head facilities. Units will utilize designated indigenous facilities until these services are terminated by enemy action. Division utility engineers will establish bath facilities in conjunction with personnel decontamination stations located at Intermediate Support Points. Field latrines will be constructed if sewerage is terminated. Unit commanders will ensure that appropriate health practices are being complied with in the collection and disposal of human waste. Latrine pits will be backfilled when full, and other waste will be hauled to the nearest landfill for final disposal. It should be noted that the cessation of water and sewerage will pose major health problems to the SYN City populace even if ad hoc measures are utilized by VII MAF. Sanitary services for the indigenous populace must be provided by the local government with VII MAF supply support (bags, disinfectant, drugs) if necessary.

Other general engineering services normally include survey support and the provision of technical engineering advice to nonengineer units. Requirements for survey support during an urban defense are minimal but a greater than normal requirement exists for strip maps and other map supplements. Engineer battalion personnel holding MOSs in Occupational Field 14 will be tasked to provide required supplemental map products within their capabilities. Reproduction of these products will be accomplished on a noninterference basis by the Service Co Hq Bn 7th MarDiv, Service Co H&S Bn FSSG, and selected elements within 7th MAW.

The most important contribution of combat engineers in an urban defense is the supervision, advice, and training given to nonengineer personnel in the subject areas of countermobility and survivability. Engineers are FORCE MULTIPLIERS in any combat environment but especially during an urban defense where every street and structure has the potential for transformation into a killing zone. It is those nonengineer personnel who will affect this transformation with supervision and advice by engineer teams and individuals. It is imperative that each and every combat engineer be technically competent and capable of passing his engineering expertise to other personnel.

## Combat Service Support Functions and Requirements

### ENGINEER CSS - HORIZONTAL CONSTRUCTION

THE ACCOMPLISHMENT OF EXTENSIVE HORIZONTAL CONSTRUCTION PROJECTS PRIOR TO D+11 COUPLED WITH COMBAT OPERATIONS OCCURRING IN AN AREA WITH WELL-DEFINED LOCs SIGNIFICANTLY REDUCES ENGINEER HORIZONTAL CONSTRUCTION REQUIREMENTS DURING THE SYN CITY DEFENSE.

#### General

Engineer combat service support tasks involving horizontal construction include:

- LOC Development
- Bridge Construction
- EAF, HLZ Construction
- Beach Preparation
- Bulk Fuel Operations
- Quarry Operations

Many of these tasks were begun as soon as the Landing Force commenced the amphibious assault into SYN City i.e., beach preparation. Other tasks such as LOC Development and EAF/HLZ Construction were accomplished through the integrated use of all engineering assets available to VII MAF. Bulk Fuel and Quarry Operations were the primary responsibility of FSSG engineers with the Wing Engr Sqdn responsible for TAFDS installation and operation. All tactical bridging assets in the MAF are organic to the Engr Supt Br Bridge Company.

The following discussion and analysis is directly applicable to Mission 6--Defense Inside the City. Other defensive missions would impose different engineer horizontal construction requirements in each of the subtasks noted above. Mission 6 horizontal construction requirements are based on the following considerations and assumptions:

- LOC development will not be required to support the combat action of GOP forces. Existing road nets outside SYN City are sufficient to accommodate combat and combat service support traffic for the short time (D+11 to D+15) that these forces are operating in the MAF Security Zone.
- All major bridging operations supporting VII MAF will occur within the city proper at North and South Rivers. Available terrain data does not permit an analysis of assault bridging requirements outside the city.
- Airfields 1 and 2 will remain operational until Aggressor units close on the FEBA on D+16 whereupon all non-V/STOL aircraft in 7th MAW (Fwd) will be redeployed to other air facilities at TABs. Remaining V/STOL assets will operate from four dispersed V/STOL facilities located within the city.
- All required beach preparation was accomplished prior to D+11 by combat engineers and elements of the two Shore Party Teams.

### LOC Development

Extensive LOC development will not be required within the city due to the existence of a well-defined all-weather road net encompassing all areas of the city. Primary and secondary routes have been designated and numerous bypass routes are available in the event that normal routes are impassable or unavailable. New construction of LOCs within the city will not be required; modifications or improvements to the existing road net will be minimal and well within available engineer capabilities.

Highways 2 and 3 originate in SYN City and run northwest and southwest respectively. No other primary roads are shown in either of these areas although it is expected that secondary roads would connect these major routes with outlying areas. By D+11, the GOP MCATFs will have been conducting combat operations in the MAF Security Zone for over a week. Resupply operations were conducted by ground transport as the primary mode supplemented by air delivery of critical supplies. It is estimated that GOP forces will be forced to conduct delaying operations forward of the GOPL from D+11 to D+14 and withdraw inside the FEBA by D+16. Time considerations preclude the development of additional LOCs to support these forces. Long-haul transport assets will move GOP supplies as far forward as possible where the supplies will be transferred to 5T cargo vehicles and marginal terrain vehicles for delivery to forward units. The MCATF trains element will be responsible for this forward delivery utilizing the available road net.

Construction of new roads within a well-developed city will not be required. The only foreseeable engineer requirement will be to enlarge turnaround areas or continue secondary roads through dead-end areas. These operations are similar to the blazing of combat trails and will require dozers, scoop loaders, and road graders to perform the necessary work. The magnitude of such efforts will be small and engineer resources will be committed for this work upon approval of the MAF engineer. Equipment requirements will be minimal and within the support capabilities of the Engr Supt Co Engr Support Bn.

## Combat Service Support Functions and Requirements

### Engineer CSS - Horizontal Construction (Continued)

#### Bridge Construction

Bridging operations during the SYN City defense are keyed to maintaining viable MSRs across the North and South Rivers within SYN City proper. On D+10 at the start of the defense, sufficient bridges are intact to handle the anticipated level of logistic traffic (See Appendix 7 (Intelligence Estimate) to Annex B (Intelligence) to OPLAN 6-81). A minimum of one span across each river must be servicable at all times. Fixed bridging assets will be used to replace damaged spans. In the event that span replacement is not feasible, float bridging assets will be used to construct reinforced Class 60-capable rafts. It should be noted that the float bridging sets normally allocated to a MAF are but marginally sufficient to construct one float bridge across North River; South River is too wide to be bridged with these assets. Given the Aggressor indirect fire capability and the relatively fixed location of a float bridge site, the use of rafting is recommended to maintain LOCs rather than the embarkation and construction of multiple float bridges.

#### EAF, HLZ Construction

Volume I of this study effort provided planning estimates concerning denial efforts expected at Airfields 1 and 2 and the level of engineering support required to rehabilitate these facilities. Both airfields were anticipated to be operational by D+11 and the arrival of the first fly-in echelon (FIE #1) was scheduled for that date. Construction of EAF 3 was not begun due to the change in the MAF mission. The tenuous nature of the MAF defense and the nonavailability of suitable areas for EAFs within the city precludes construction of these facilities during the defensive period. Airfields 1 and 2 will be utilized until their positions and operation become untenable.

Four HLZs have been designated to support GOP forces operating outside the city. These HLZs will be sited in zones of opportunity requiring a minimum overall level of engineer preparation, and engineer resources will be attached to HSTs as appropriate. After the GOP forces have withdrawn inside the FEBA and VII MAF is wholly contained within the city, HLZ construction will not be required but engineers may be tasked to remove obstructions to flight in approach and retirement lanes. These obstructions would include tall vegetation, power lines, light posts, and fencing. It is estimated that each landing site would require no more than one squad hour of engineer preparation.

### Beach Preparation

Beach preparation tasks normally include the removal of obstacles posing a threat to landing operations and the enhancement of mobility within the beach area. By D+11, combat engineers and engineer-oriented elements of the Landing Force Shore Party Group had removed or neutralized Aggressor-emplaced obstacles at RED and BLUE Beaches. Elevated causeways had been installed at each beach and dunnage had been emplaced in areas of poor trafficability. Road graders and dozers were used to maintain beach routes on the offshore islands and mainland beaches. Beach preparation requirements during the SYN City defense involve the continued maintenance of these beach routes. A minimum of one road grader should be provided at each of the beaches to accomplish this continued maintenance. The Engr Supt Bn FSSG will be tasked with this responsibility.

### Quarry Operations

Quarry operations per se were not required during the SYN City offensive. Local materials, including sand and gravel, were exploited to effect repairs to road and airfield surfaces. Requirements for sand increase markedly during defensive operations when sand is used to fill sandbags and control the spread of fire within buildings. The requirement for construction-quality gravel decreases once the airfields become untenable and repair efforts are discontinued. The rock crusher and screening plant organic to the FSSG should be left in operational status in the event that crushed stone is required for other purposes.

The requirement for sand during defensive operations was estimated at 3,865 cubic yards alone to fill sandbags on FEBA positions. A similar quantity would be required if Forward Defense Area forces were required to withdraw to Phase Line Cobra or other intermediate positions. Sand placed on the floor of defended rooms would increase the requirement to approximately 5,000 cubic yards. FSSG engineers should be prepared to provide this quantity of sand from mainland beach areas should appropriate materials not be available near defensive positions. If all defensive preparations were to be completed in three days then 33 M51A2 dump trucks would be required if each dump truck delivered ten full loads per day for three days and 80 percent of the vehicles were operational at any one time.

The sand requirement would decrease if Forward Defense Area units procured earth from nearby locations or occupied reinforced-masonry buildings that offered an acceptable level of ballistic protection in the absence of extensive sandbagging. An operational indigenous water distribution system would further reduce the sand requirement as defending elements could periodically soak building interiors to reduce the fire potential. A minimum of thirty dump truck days should be programmed to deliver sand to forward units.



## Combat Service Support Functions and Requirements

### Engineer CSS - Horizontal Construction (Continued)

#### Bulk Fuel Operations

The overall concept for bulk fuel operations supporting defensive operations does not change materially from that established during the SYN City offense. Bulk fuels will be stored at dispersed locations in facilities organic to the MAF supplemented by suitable indigenous facilities sited in favorable locations. By the end of Period V, bulk fuel storage facilities had been established at both landing beaches, both airfields, Industrial Area 1, and the port. The establishment of the FEBA at the metropolitan boundary of SYN City together with the eventuality of ceasing fixed-wing air operations at Airfields 1 and 2 necessitates the relocation of bulk fuel storage equipment at those facilities.

The 3 DOS stockage level provided by the end of Period V is judged insufficient to support VII MAF defensive operations through periods of intense interdiction of SLOCs and possible disruption of ship-to-shore bulk fuel operations. The reduced air and ground assets within the FBH permit stocking a 20 DOS level of bulk fuels (MOGAS, DF-2, JP 4/5) with extra bladders available to replace unservicable items. Bulk fuels will be stored at facilities located in ISPs and CSSAs. Drummed fuels will be maintained as emergency stocks at designated forward locations as well as at consolidated CSS activities.

The table opposite shows the distribution of stored fuels and the number of storage systems to hold these fuels. System quantities are based on the assumption that the preponderance of 7th MAF (Fwd) will be redeployed to the TAB when the airfields become untenable on or about D+16. Unit distribution will be the norm for those units without an organic fuel tanker capability. Fuel support for GOP forces will be by long-haul semi-trailer fuel tanker supplemented by M49A2C tankers.

Fuel storage requirements for ground assets were based on moderate intensity factors contained in the JSCP. Class III(A) requirements were based on the actual number of squadrons remaining in the FBH subsequent to D+16 multiplied by appropriate daily fuel consumption factors given in the MAGTF Lift Validation. These general planning factors and the associated percentage splits between fuel types would be modified based on actual experience within the FBH. Appendix A to this volume provides an estimate of fuel consumption per vehicle category for VII MAF defensive forces. Chapter VII-Class III provides additional discussion concerning fuel consumption in an urban defense. Initial bulk fuel planning should utilize the greater of conventional and urban fuel factors to preclude the possibility of insufficient stocks to support a renewed offense in conventional terrain outside the city.

The impact of a prolonged urban defense upon bulk fuel operations is twofold. First, less fuel will be consumed during an urban defense (all defensive missions except Defend Outside the City) as ground units are deployed in relatively static positions and all logistic operations are contained within an area of 100 sq km as in the SYN City case. Second, the urban area itself may provide suitable bulk fuel storage facilities that may be used by VII MAF to supplement its organic resources. Examples of these indigenous facilities include service stations, diesel locomotive servicing facilities, heavy equipment yards, and fuel tank farms. Information concerning the capacity or suitability of any of these assets is not provided in the SYN City Data Base and fuel storage planning has proceeded on the assumption that these facilities are not suitable or available. In addition to indigenous facilities intended specifically to store bulk fuels, the urban environment may provide basement or subterranean areas suitable for fuel storage provided that they are cleaned, leak checked, and vented. Bladders may be placed inside buildings if supporting columns are widely spaced or removable.

TABLE V-3. BULK FUEL STORAGE REQUIREMENTS FOR MISSION 6

LOCATION	TYPE FUEL	FUEL QUANTITY	# AAFS @ 600K GAL	# TAFDS @ 60K GAL	DRUMS KERO	DRUMS LUBE(A)	DRUMS LUBE(W)
ISP(ea)	JP 4/5	216,692	-	4			
	MOGAS	74,340	.2	-	84	24	191
	DF-2	330,540	.6	-			
CSSA 1	JP 4/5	1,192,800	2.0	-			
	MOGAS	375,240	.8	-	424	131	963
	DF-2	1,668,440	2.8	-			
CSSA 2	JP 4/5	397,600	.8	-			
	MOGAS	163,900	.4	-	188	44	428
	DF-2	710,900	1.2	-			
	TOTAL BULK FUEL SYSTEMS		11.2	16			

- NOTE: 1. Moderate intensity factor Class III(W) = 6.28 gal/man/day  
4.94 (78.7%) DF-2 } BULK  
1.11 (17.7%) MOGAS }  
.07 (1.1%) KERO } DRUM  
.158 (2.5%) LUBE }
2. Moderate intensity factor Class III(A) = 8.2 gal/man/day  
8.15 (99.4%) JP 4/5 - BULK  
.05 (0.6%) AVLUBE - DRUM
3. 2/3, 1/3 split between fuels at CSSAs 1 and 2 (MOGAS, DF-2).  
3/4, 1/4 split between fuels at CSSAs 1 and 2 (JP 4/5).
4. Drummed fuel in 55 gal drums, same split as bulk fuels at CSSAs.
5. Storage requirements are applicable D+16 through D+40.

## Combat Service Support Functions and Requirements

### ENGINEER CSS - VERTICAL CONSTRUCTION

REQUIREMENTS FOR VERTICAL CONSTRUCTION DIMINISH SIGNIFICANTLY DURING AN URBAN DEFENSE AS VII MAF UNITS UTILIZE INDIGENOUS STRUCTURES AND FACILITIES. THE GREATEST REQUIREMENT IN THIS FUNCTIONAL AREA IS THE ASSISTANCE PROVIDED DURING THE HARDENING OF DEFENSIVE POSITIONS AND STRONGPOINTS.

#### General

Engineer units organic to the MAF are responsible for providing combat service support in all areas of vertical construction. Some of the vertical construction tasks normally accomplished in a combat zone include the construction of:

- Temporary Camps
- Maintenance Facilities
- Storage Facilities
- Landing Ramps and Docks
- Medical Facilities
- Defensive Positions

Vertical construction requirements supporting prolonged combat operations in nonurban environments are generally quite extensive and involve a significant portion of the MAF engineering capability. During the SYN City offense, units were phased ashore and operated from organic shelters and tentage until suitable buildings were located in areas that had been seized, consolidated, and evacuated. Engineer representatives accompanied unit commanders during the building survey and selection process to provide technical advice concerning the military suitability of selected structures.

During the VII MAF defense of SYN City (Missions 6 through 10) even greater utilization of indigenous structures will occur as units and activities deploy within the city into relatively static positions and locations noted by mission concepts given in Chapter III. The new construction of any of the facilities noted above would be unnecessary in any moderate-size city and would divert engineer resources from their priority task during defensive operations i.e., implementation of the overall barrier plan and hardening of defensive strongpoints. Although the construction of new structures will generally not be necessary within an urban operation, selected structures may require modification so that assigned units may better accomplish their mission. This effort is addressed as Facilities Maintenance vice Vertical Construction.

### Temporary Camps

The construction of temporary camps will not be necessary in SYN City during the anticipated period of defensive operations. Elements of VII MAF will utilize organic shelters or annex civilian structures as appropriate to the unit mission and tactical situation. Billeting for tactical units will be co-located with forward defensive positions; billeting for other CSS units will be in structures in the immediate vicinity of unit work areas or supply points. POW/CIs will be housed in the SYN City prison complex and other indigenous detention facilities dispersed throughout the city. POW compounds established during the early stages of the amphibious assault at RED and BLUE beaches will be used to provide temporary detention for POW/CI overloads until more suitable structures are designated and prepared. DPRES will be housed in relocation centers at public schools located a minimum of one kilometer from the metropolitan boundary. The Civil Affairs Section provides additional details concerning temporary shelter for these civilians. In short, VII MAF will utilize indigenous structures to the maximum extent possible for billeting, detention, and civilian relocation; temporary camps or elements thereof will not be constructed during the SYN City defensive operation.

### Maintenance Facilities

All VII MAF units will require areas dedicated for maintenance purposes. The size and location of each maintenance area will depend on the unit T/E and the level of maintenance performed by the maintenance activity. The majority of first echelon maintenance can be accomplished in the open or under expedient shelter provided by tarpaulins or ponchos. Higher echelon maintenance of large or complex systems is usually accomplished in battalion rear areas inside tentage designed specifically for maintenance purposes. All maintenance operations are enhanced if accomplished inside shelters or structures which provide cover, concealment, and protection from climatic influences.

Maintenance operations within SYN City are accomplished at numerous locations dispersed throughout the city although most of the higher echelon maintenance will be performed at ISPs and CSSAs. All maintenance sections will be encouraged to locate their activities inside buildings with suitable structural and accessing characteristics. (See Volume I Figure V-10 for the relation of building characteristics to military elements.) Many shopping centers and storefront businesses would provide excellent facilities for small maintenance sections. Warehouses, auditoriums, and other buildings with large open areas could provide sheltered environments for larger scale maintenance operations typical of the Maintenance Bn FSSG. Service stations and other indigenous maintenance facilities will be converted to military use provided that they are suitably located.

Maintenance activities located in areas devoid of suitable nearby structures will utilize organic shelters located over hardstand surfaces such as streets or parking areas. Engineer construction requirements supporting maintenance activities in the city will be negligible and engineer resources will not be earmarked for this purpose.

## Combat Service Support Functions and Requirements

### Engineer CSS - Vertical Construction (Continued)

#### Storage Facilities

Construction of storage facilities will not be required during defensive operations in SYN City. Supply stocks requiring an extra measure of protection will be stored indoors. Other supplies will be stored indoors whenever possible. Estimated gross storage requirements at each of the supply points is shown in Table V-20. The key to supply survivability in an urban defense lies in supply dispersion which will be achieved by supplies on position, supplies stored at ISPs, and supplies stored in the CSSAs. Suitable structures would have been identified during the course of the amphibious assault and appropriate structural modifications performed as soon as engineer resources became available.

Other storage expedients include the use of containers, tarpaulins, and tentage not required for other uses. These expedients would provide environmental protection for sensitive supplies until building modifications were complete and interior space was available. Unfortunately, two of the three major industrial areas in SYN City lie outside the metropolitan boundary and would not be available for supply storage once Aggressor forces penetrated the MAF security zone. The third industrial area, near Airfield 1, lies astride a likely penetration zone and should not be used for supply storage in the defense.

#### Landing Ramps and Docks

The SYN City Port, and elevated causeways installed during the amphibious assault, provide sufficient interfaces to sustain the required level of throughput during defensive operations. Docks in the main port area suffering a light level of damage during the assault were cleared of debris and made serviceable by D+6. M4T6 ramp sections were installed on causeway sections in the offshore channels by late on D-day. The South River is not bulkheaded and will present no problem to rafting or ferry operations if causeway sections are used to provide the ship/shore interface.

#### Medical Facilities

Vertical construction of medical facilities to support VII MAF defensive operations is not warranted due to the probable availability of indigenous structures suitable for medical functions. The MAF has the option of annexing existing civilian hospital facilities, although it is expected that these facilities will be fully required to meet the medical needs of the local populace. Selection criteria for structural suitability for medical purposes are not as rigorous as those for supply storage or maintenance, and numerous structures in SYN City should meet the needs of battalion aid stations as well as elements of the Medical Bn FSSG.

### Defensive Positions

The principal vertical construction task during the SYN City defense is to assist the forward defense force in preparing and hardening defensive positions in the Forward Defense Area. Contrary to popular belief, it is not solely an engineer responsibility to prepare these strongpoint positions. Rather, engineer teams should be tasked to provide technical assistance to tactical units and accomplish those aspects of defensive position preparation beyond the capabilities of tactical units. Such subtasks would include (see Engineer Survivability Enhancement) improving backblast ventilation, clearing fire zones, installing wire mesh over windows, breaching loopholes, etc. It is estimated that one engineer company (with minor equipment augmentation) would be required for the duration of three 18-hour days (D+11 through D+13).

TABLE V-4. ENGINEER VERTICAL CONSTRUCTION TASKS DURING SYN CITY DEFENSE (MISSION 6)

<u>ENGR CSS TASK</u>	<u>SYN CITY REQUIREMENT</u>	<u>RESPONSIBLE UNIT</u>	<u>MID-RANGE IMPACT</u>
Temporary Camps	LOW	Engr Supt Bn	No Change
Maintenance Facilities	LOW	Engr Supt Bn Wing Engr Sqdn	No Change
Storage Facilities	LOW	Engr Supt Bn	Lower-Container Storage
Landing Ramps and Docks	LOW	Engr Supt Bn NMCB	Lower-ALS
Medical Facilities	LOW	Engr Supt Bn	No Change
Defensive Positions	AVG-HIGH	All Engr Units	Increase Rqmt

## Combat Service Support Functions and Requirements

### ENGINEER CSS - FACILITIES MAINTENANCE

ENGINEER FACILITIES MAINTENANCE TASKS INCREASE DURING AN URBAN DEFENSE WHEN DEFENDING UNITS MAKE FULL USE OF ALL SUITABLE INDIGENOUS FACILITIES TO FURTHER THE DEFENSIVE EFFORT. BUILDING MODIFICATIONS PERMITTING UNIT DEPLOYMENTS AND MATERIEL DISPERSION AND STORAGE WILL BE ACCORDED THE INITIAL PRIORITY, WHILE LOC MAINTENANCE WILL BE A CONTINUING REQUIREMENT.

#### General

SYN City provides many facilities that would further defensive and combat service support efforts by VII MAF. Selected facilities will require minor modifications to suit specific military purposes while other facilities will require continued maintenance to provide the necessary level of support for combat, combat support, and combat service support operations. The categories of facilities maintenance, as given in FMFM 4-1, include:

- Buildings
- Admin/Maint Structures
- Drainage Systems
- Airfield Surfaces
- Roads and Bridges

During the course of the amphibious assault, the majority of engineer combat service support efforts were towards the rehabilitation of airfields and port facilities and the progressive establishment of combat service support activities. Facilities maintenance tasks accomplished during Operation BREAKER ONE were primarily concerned with the repair of damage to Airfield 1, improvement of drainage at BSAs RED and BLUE, and hasty repairs to primary roads in the vicinity of BSAs/CSSAs. All bridges were inspected for obvious structural damage and repairs were made accordingly within the capabilities of Landing Force engineer elements. Of these tasks accomplished during the offense, the restoration of Airfield 1 required the greatest engineer effort. (See Volume I pp. V-24 through V-27 for additional details concerning this rehabilitative effort at Airfield 1.)

By D+10 when VII MAF received the mission to defend SYN City, Airfield 1 was in a good state of repair and ready to accommodate the arrival of the first fly-in echelon of 7th MAW. Airfield 2 had been cleared of mines and an expeditionary air base capability was within two days of additional engineer effort. All combat damage to primary and secondary roads within the city had been repaired, and all bridges had been inspected and cleared for military traffic by the CG FSSG. Drainage improvements were complete at BSA RED and CSSA 2, and blocked culverts in the main port area had been cleaned and returned to service. Building maintenance efforts were low during the offensive period as units "made do" with what was available. Organic tentage was used by some elements for billeting and maintenance purposes.

## Structural Maintenance

VII MAF will utilize many structures in SYN City for defensive positions, administration, maintenance, and supply activities. It is certain that some of these structures will require minor modifications to increase the level of military efficiency in activities occurring within. This subsection heading, Structural Maintenance, is actually a misnomer--very little maintenance per se will be accomplished during defensive operations. Rather, a carefully controlled level of destructive modification will occur within buildings used for defensive, maintenance, or supply purposes. The Cbt Engr Bn will bear the primary responsibility for technical advice and assistance during building modifications in the Forward Defense Area. The Engr Supt Bn FSSG will support modification efforts at ISPs and CSSAs. The Wing Engr Sqdn 7th MAW will provide any necessary advice and engineer effort at existing airfields, and dispersed V/STOL facilities once the airfields become untenable.

Specific building modifications will depend upon the building structure and its intended function of the building within the overall tactical and logistical concept. Examples of selected building functions and associated potential modifications are noted below.

- Billeting - Buildings used for this purpose will require few modifications other than the provision of adequate ingress/egress routes. Personnel should be billeted on lower floors to reduce reliance on stairwells and elevators, if operational.
- Defensive Positions - Building modifications include hardening of firing positions, preparation of ingress/egress routes, enhancement of room ventilation, and the possible removal of walls to permit combat vehicle hide positions. See Engineer Survivability Enhancement for anticipated engineer requirements.
- Supply - The storage of supplies within buildings will require the enlargement of entryways and the removal of selected exterior and/or interior walls. These modifications will be accomplished in an expedient manner using heavy engineer equipment and/or demolitions.
- Maintenance - Basically the same type of modifications as for Supply purposes.

All building modifications should be completed by D+16 when the Aggressor lead elements are expected to close on the FEBA (Missions 6 through 10). Engineer support requirements are based on the accomplishment of the required modifications during three 18-hour work days (D+12, 13, 14). The engineer level of effort during this period is anticipated to require the resources of one reinforced engineer company from the Cbt Engr Bn and one engineer company (-) from the Engr Supt Bn FSSG.



## Combat Service Support Functions and Requirements

### Engineer CSS - Facilities Maintenance (Continued)

#### Drainage Systems

Drainage facilities for storm water disposal in SYN City consist of storm sewers in the heart of "New City" and open ditches following natural drainage patterns in the remainder of the metropolitan area. The SYN City Data Base notes that the existing drainage network is sufficient to handle the runoff of up to 10-year storms with only short-term flooding and sewer backup. Expedient modifications to the existing network were made during the offensive period in the vicinity of CSS activities. Maintenance of drainage systems during defensive operations will be limited to the cleaning of culverts and open ditches only if the system damage has a negative impact on proximate military activities. Engineer requirements are expected to be minimal and drainage work will be accomplished concurrently with road maintenance.

#### Roads

The SYN City road system is well-developed and all roads within the city are hard-surfaced and were in a good state of repair before the MAF conducted the amphibious assault to seize the city. During the course of the amphibious assault, damage to selected road segments was unavoidable but generally confined to the main port area. Engineer elements were successful in their efforts to repair key primary and secondary routes in the city by D+10. Repairs consisted of rubble removal (dozing to road-sides) and the backfilling and compaction of road craters.

Defensive operations conducted within a city are expected to increase the frequency and importance of road repair efforts. A significant level of combat damage is expected from indirect fire and air-delivered munitions, especially from an Aggressor force with a substantial artillery support capability. It is imperative that key routes within the city be kept open to accomplish vital combat and logistic functions. Major engineer units organic to VII MAF will be assigned sectors of responsibility as shown in the figure opposite. Cross-support may be necessary during periods of intense combat action.

The level of engineer effort to maintain road surfaces will obviously depend on the number of roads deemed vital to the accomplishment of the MAF mission and the intensity of combat action. As a minimum, those primary and secondary roads designated in the traffic control plan should be maintained in servicable condition at all times. Additionally, secondary and tertiary routes near defensive strongpoints should be kept open for local counterattacks and the delivery of resupplies. Appendix B to ECP 4-4 (Engineer Operations) suggests that one engineer squad with organic tools plus the reinforcement of dump trucks and a road grader provides a sufficient capability to service 10 miles of road in a 10-hour day. Accordingly, one engineer road maintenance team with attached engineer equipment will be provided by each of the Cbt Engr and Engr Supt Bns.

## Bridges

SYN City bridges spanning the North and South Rivers are prime targets for Aggressor indirect fire and air-delivered munitions. The denial of these bridges coupled with intense Aggressor pressure on the FEBA would place severe constraints on the MAF and jeopardize the defensive mission. It is vital that at least one bridge across each river be servicable at all times and capable of supporting up to Class 70 loads during risk crossings. The Bridge Co Engr Supt Bn FSSG will be tasked to inspect all extant bridging a minimum of once per day to check structural integrity and determine the level of battle danger.

Bridge maintenance activities will consist of debris removal, maintenance of load classification signs and telltales, welding of structural members, and maintenance of approach routes leading to highway bridges. The SYN City Data Base does not provide information concerning the span composition of extant bridging. However, it should be assumed that the replacement of single spans is feasible and within the capabilities of the Bridge Co once available float bridging assets have been configured as rafts. Fixed bridging assets organic to the MAF include three M6 bridge sets. Each bridge set contains enough equipment to construct 210 feet of single truss bridge. M6 bridging can safely carry Class 70 loads on single truss spans up to 120 feet in length. Erection of a 120' single truss bridge span would require approximately two hours and between 25 and 75 personnel depending on the construction method employed.

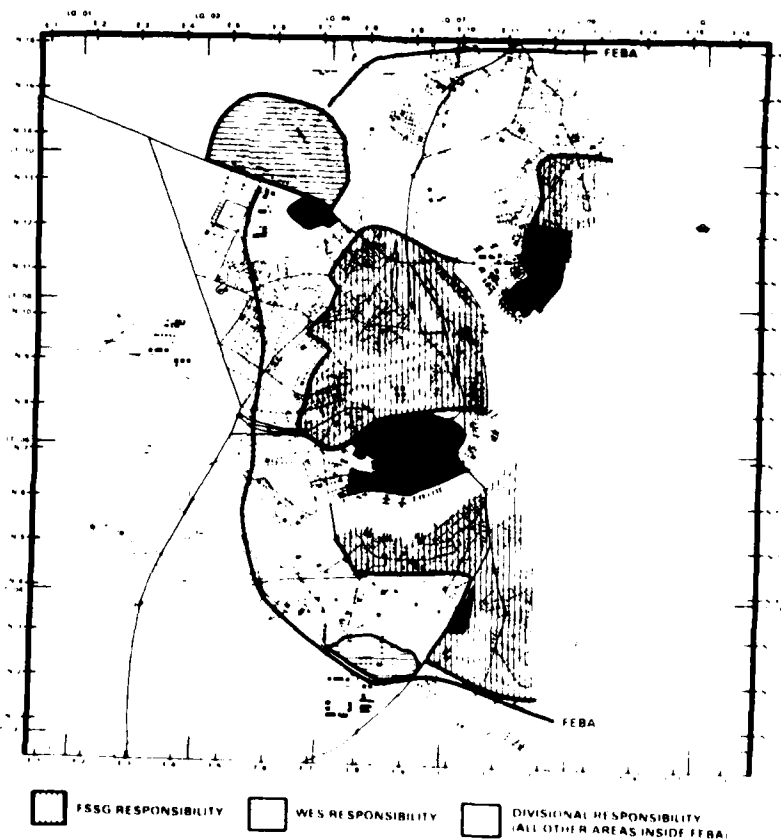


Figure V-2. Sectors of Responsibility - Road Maintenance

## Combat Service Support Functions and Requirements

### Engineer CSS - Facilities Maintenance (Continued)

#### Airfield Surfaces

Volume I of this study effort provided details concerning initial rehabilitative efforts anticipated at Airfields 1 and 2. Both airfields are operational on D+11 at the start of defensive operations. The Wing Engr Sqdn will be tasked to maintain these airfield surfaces until such time as the airfields become untenable and 7th MAW fixed-wing assets are redeployed to theater airbases. 7th MAW (Fwd) V/STOL assets will operate from V/STOL facilities near each of the ISPs. Construction of the V/STOL facilities will commence on D+11 so that they are operational by D+15.

The maintenance of airfield surfaces subsequent to D+10 will involve rapid runway repair (R<sup>3</sup>) techniques as well as conventional matting operations.

- R<sup>3</sup> techniques will be used to repair landing surfaces and taxiways at Airfield 1 and V/STOL facility landing surfaces if the facilities are on hardstand.
- Conventional matting techniques will be used to repair battle damage at Airfield 1 parking areas, all Airfield 2 surfaces, and any areas at the V/STOL facilities not on hardstand.

The composition of the R<sup>3</sup> Team is given in Volume I Figure V-7. It is recommended that two teams, structured from available Wing Engr Sqdn assets, be maintained during the course of defensive operations. Initially when Airfields 1 and 2 are operational, one R<sup>3</sup> Team will be located at each airfield. Once the airfields become untenable and V/STOL operations are conducted from the four dispersed V/STOL facilities, one R<sup>3</sup> Team will be tasked to support repair efforts at two facilities.

Materials used to accomplish repairs to airfield and V/STOL facility surfaces will consist of SILIKAL, crushed stone, cement, FRP matting, and aluminum matting sections. Indigenous materials will be exploited to the maximum extent possible but cement and crushed stone are the only items that might be available in SYN City. All other items noted above must be embarked by the ATF or follow-on shipping and scheduled for early arrival in the AOA.

TABLE V-5. FACILITIES MAINTENANCE TASKS DURING SYN CITY DEFENSE  
(MISSION 6)

FACILITIES MAINTENANCE SUBTASK	DURATION	RESPONSIBLE UNIT	LEVEL OF EFFORT
STRUCTURAL MAINTENANCE	D+11 TO D+15 <sup>1</sup>	CBT ENGR BN ENGR SUPT BN WING ENGR SQDN	1 ENGR CO (REIN) 1 ENGR CO (-) ELMS TAFDS, ENGR SEC
ROAD REPAIR	D+11 TO D+40	CBT ENGR BN ENGR SUPT BN WING ENGR SQDN	1 ENGR SQD (REIN) 1 ENGR SQD (REIN) R <sup>3</sup> TEAMS
DRAINAGE SYSTEMS <sup>2/</sup>	-	-	-
BRIDGE REPAIR	D+11 TO D+40	ENGR SUPT BN	ELMS BRIDGE CO
AIRFIELD SURFACES <sup>3/</sup>	D+11 TO D+40	WING ENGR SQDN	2 R <sup>3</sup> TEAMS

Note 1/- Duration noted is for initial modifications. A reduced requirement exists from D+16 to D+40.

2/- Sectors of responsibility same as for Road Repair. Level of effort included within resources allocated for Road Repair.

3/- Airfield surfaces D+11 to D+15. V/STOL surfaces D+11 to D+40.

## Combat Service Support Functions and Requirements

### ENGINEER CSS - UTILITIES SUPPORT

FSSG AND WING ENGINEERS ARE RESPONSIBLE FOR PROVIDING THE FULL RANGE OF ESSENTIAL UTILITIES TO THEIR SUPPORTED ORGANIZATIONS. ALTHOUGH THE MAF DEFENSES HAVE BEEN ESTABLISHED WITHIN A CITY WITH VIABLE UTILITY NETWORKS, VII MAF UNITS SHOULD BE SELF-RELIANT IN TERMS OF UTILITY SUPPORT IN THE EVENT THAT INDIGENOUS UTILITIES ARE DENIED BY AGGRESSOR FORCES OR COMBAT ACTION.

VII MAF engineer units are tasked to provide the full range of utility services including mobile electric power, water, bathing and laundry services, and in some instances sanitary head facilities. Each of the major engineer units within the MAF provides utility support to its parent organization and cross support when necessary to ensure that aggregate utility requirements are satisfied with efficient use of both equipment and human resources.

The urban environment provides several opportunities for MAF engineers to utilize indigenous utility networks. Indigenous utility systems received a moderate level of damage during the amphibious assault and consolidation of SYN City but indigenous repair crews have restored the following level of service:

- Electric Power - Available 12 hours per day to most areas of the city.
- Potable Water - Purification and distribution system is operational but several water towers were destroyed or damaged. Local authorities have established a water delivery/rationing system for localities serviced by these towers.
- Garbage - Pickup and disposal operating at 25 percent of former level; adequate for reduced waste levels.
- Sewerage - Heavy damage has reduced sewerage capability to less than 50 percent of the former level. Full service should be restored within 10 days. Civil authorities have asked the populace to minimize the level of effluent until full service is restored.

MAF utility planning should proceed under the assumption that each of these utilities will be denied during the course of prolonged defensive operations. All utility facilities are subject to attack by missiles (SSM) beginning on D+10 and by artillery after the GOP has been breached. The hydroelectric plant and water treatment plant lie outside the metropolitan boundary and would become untenable as Aggressor forces closed on the FEBA. The denial of these services would place a heavier burden on VII MAF and cause additional unrest amongst the populace. VII MAF should be self-reliant in terms of essential utility services by D+14. Support for the SYN City populace will be limited to a subsistence level of potable water, estimated to be one gallon per person per day. Local authorities will be responsible for establishing guidelines to prevent the outbreak of disease due to the denial of sewerage.

MAF requirements for mobile electric power are expected to remain at approximately the same level as in a nonurban environment. Engineer utilities sections will provide mobile electric power (MEP) support to those units requiring external support. Generating equipment will be located outside buildings and provided with protection against direct and indirect fires. Tertiary distribution systems may be modified to interface with USMC equipment provided that the sections are electrically isolated from the remainder of the indigenous system. These modifications would be accomplished only at CSS activities to the rear of the Forward Defense Area and only after all MAF units had been provided with essential MEP support using field distribution systems. Indigenous utility workers will be encouraged to remain at their jobs and assist with these system modifications.

Daily water requirements for both VII MAF personnel and indigene are summarized in the table below. While VII MAF can supply potable water exceeding the total requirement for military units alone, the total denial of the indigenous system would require the use of uncontaminated nonpotable for selected purposes such as vehicle cooling systems, laundry and bathing. The indigenous distribution system should be used to be maximum extent practicable for supplying nonpotable water; organizational assets will be used to store and distribute potable water. Personnel should be informed through normal channels of any restrictions concerning water use, and tests for water quality should be in accordance with established policies. In the event that sections of the indigenous system can be made operable (through the efforts of civilian workers supervised by the 4th Civil Affairs Group Public Works Team), the MAF engineer will issue instructions as to the redistribution of water production responsibilities.

Bathing facilities will be established in conjunction with personnel decontamination stations (PDS) located at ISPs and CSSAs. The Engr Supt Bn will establish laundry facilities in each of the CSSAs. All units will be responsible for backhauling garbage and human waste to existing landfills. Engineer units will not be tasked to provide equipment or personnel to accomplish this function for other units.

TABLE V-6. SYN CITY WATER REQUIREMENTS (DEFENSE)<sup>1</sup>

	<u>MAXIMUM PERSONNEL</u>	<u>LONG TERM RQMT<sup>2</sup>/ % POTABLE<sup>4</sup></u>	<u>MINIMUM RQMT<sup>3</sup>/ % POTABLE</u>	<u>POTABLE PRODUCTION CAPABILITY<sup>5</sup></u>
DIV	19,044	238,440/10%	105,132/22.6%	220,000
FSSG	15,019	374,690/5.4%	269,557/7.5%	280,000
WING	11,156	151,560/9.2%	73,468/19.0%	440,000
SYN CITY	250,000	2,500,000/12.5%	750,000/41.7%	ASSUMED NONE
TOTAL	295,219	3,264,690/11.3%	1,198,157/30.9%	940,000

Note

- 1 - Methodology and user consumption as per TM 5-700 (Field Water Supply); personnel strengths and facilities demand from VII MAF situation effective D+11.
- 2 - Equivalent to temporary camp with limited bathing facilities; individual 10 gal/day.
- 3 - "Normal" consumption (TM 5-700); individual 3 gal/day.
- 4 - All water must be free from biological and chemical contamination; 1.25 gal/man/day accepted as the minimum potable requirement (STANAG 2136 App.G).
- 5 - 80% availability, 1000 gph production, 20 hr/day, U2200 units remain at theater airbase.

## Combat Service Support Functions and Requirements

### ENGINEER CSS - TECHNICAL SUPPORT

THE PRINCIPAL ENGINEER CSS TECHNICAL SUPPORT TASKS DURING AN URBAN DEFENSE WILL BE THE PREPARATION OF SUPPLEMENTAL MAP PRODUCTS AND THE COMBAT ENGINEER TECHNICAL ADVICE PROVIDED TO NONENGINEER PERSONNEL.

Many of the tasks traditionally accomplished by military engineers will, by necessity, be accomplished by nonengineer units due to priority tasks that must be accomplished by engineers. Development of protective positions, camouflage, field decontamination, and expedient demolitions can be performed by virtually any maneuver unit. Cartographic and survey tasks will still be performed by engineer personnel in the various H&S companies. Assisting nonengineers to accomplish simple engineer tasks reduces reliance upon engineers and promotes efficient use of engineer resources. It is recommended that familiarization be accomplished during advanced individual training and that periodic refresher courses to be conducted by a training cadre from the Combat Engineer Battalion.

The availability of accurate nonstylized map products of the SYN City area should be ascertained as soon as VII MAF receives its warning order. Contingency support from mapping agencies within the national command structure should be requested and mapping flights flown if necessary. In-country agents will procure any existing SYN City map products, including those detailing utility networks. Detailed pictomaps may be prepared by intelligence agencies within CONUS or by the FMF Topographic Platoon once the Landing Force is within the AOA. The Topo Plt will be responsible for compiling map revisions and omissions and overprinting required data upon standard map products. Map revisions may include CCM data, building height profiles, or other special data of relevance. The preparation of nonstandard map products assumes a greater importance during an urban defense if these products are not already available. The FMF Topographic Platoon will bear the primary responsibility for preparing special operations maps and photomosaics while each of the engineer battalions will support its particular organizations with detailed strip maps and other products as required. The Service Co Hq Bn 7th Mar Div should be prepared to reproduce these special map products.

Engineer survey tasks will decrease significantly as VII MAF consolidates its defenses within the metropolitan boundary of SYN City. Normal survey tasks include those supplementing artillery firing data as well as those used to layout roads, airfields, and other large engineer horizontal construction projects. The SYN City area already has a well-defined road network and the construction of additional airfields is not feasible nor contemplated within the metro area. The enlargement of Airfield 2 to an EAB capability was accomplished prior to D+11.

The largest requirement of engineer technical support is the training of nonengineers to accomplish engineer tasks. Many engineer tasks are not equipment-oriented and could be successfully accomplished by properly trained maneuver unit personnel. Some of these tasks are listed below:

- Expedient Demolitions
- Camouflage
- Obstacle Construction
- Development of Protective Positions
- Field Decontamination
- Reconnaissance

The shift to a defensive mission on D+11 and the probable arrival of Aggressor lead elements at the FEBA by D+16 requires that all defense preparations, including the implementation of outer and inner barriers, be completed within several days time. The only hope of accomplishing these preparations within the required time is to utilize divisional personnel supervised by combat engineers. Nonengineer personnel should receive a minimum level of training in such tasks as mine installation, barbed wire deployment, and expedient urban obstacles before the units land in SYN City.

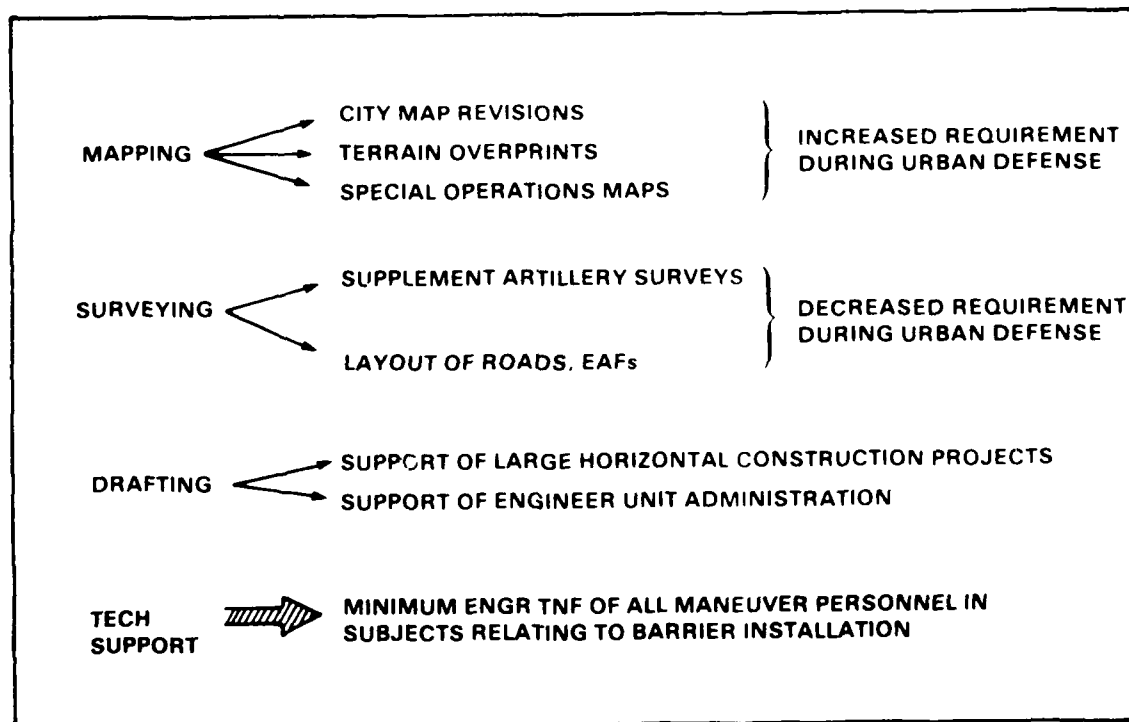


Figure V-3. Engineer Technical Support Tasks



## Combat Service Support Functions and Requirements

### CIVIL AFFAIRS

CIVIL AFFAIRS INCLUDES THOSE PHASES OF THE ACTIVITIES OF A COMMANDER WHICH EMBRACE THE RELATIONSHIP BETWEEN THE MILITARY FORCES AND CIVIL AUTHORITIES AND PEOPLE IN A FRIENDLY COUNTRY OR AREA, OR OCCUPIED COUNTRY OR AREA WHEN MILITARY FORCES ARE PRESENT. (JCS Pub 1)

#### Civil Affairs Situation in SYN City on D+11

The people of AGGRESSORLAND are generally hostile to the US and entirely in sympathy with the Aggressor cause. Overt hostility during the assault and consolidation phases was minimal with respect to the general populace, but numerous sniper/sapper attacks have occurred, particularly in CSS areas. Approximately 34,000 evacuees and refugees have been placed in DPRE assembly areas, principally schools. Adults and teenagers in the assembly areas are becoming less cooperative, and many are becoming unruly. The remainder of the populace have not caused significant problems to date. Most of the 170 containers of food relief supplies for civilian consumption have been offloaded but not yet provided to local authorities for distribution to the populace.

#### Areas to be Evacuated

The areas to be evacuated were determined by analyzing the defensive concept for each course of action. In particular, the location of the FEBA and the nature of the combat actions that were visualized influenced the decision regarding which areas would be evacuated. Several factors were considered in making this determination:

- Operational Considerations: Clear key defensive areas, reduce potential civilian interference, eliminate fraternization.
- Logistic Considerations: Minimize civil affairs logistic efforts in forward areas, simplify civilian logistic support by local agencies, reduce the need for emergency medical treatment or evacuation in key areas, enhance long-range civil affairs function.
- Security Considerations: Reduce observation by hostile populace of defensive preparations and order of battle, reduce enemy's potential for gaining HUMINT if he seizes sections of the FEBA.
- Humanitarian Considerations: Remove civilians from areas that will inevitably experience heavy combat, avoid international recrimination.

TABLE V-7. ESTIMATED EVACUEE PROBLEM

DEFENSIVE OPERATIONAL CONCEPT (TACTICAL COURSE OF ACTION)	EVACUATION REQUIREMENTS IN THE DEFENSE*	REMARKS
1 DEFENSE OUTSIDE THE CITY	0	THIS CONCEPT PROVIDES FOR DEFENDING SYNCITY WITH THE FEBA ESTABLISHED ON THE FBHL AND THE GOP WELL BEYOND THE FEBA. NO ADDITIONAL EVACUATION OF CIVILIANS IS REQUIRED. BUT THE 34 000 ALREADY EVACUATED CANNOT BE PERMITTED TO RETURN TO THEIR HOMES IN THE CSSAs AND AIRFIELD AREAS
2 DEFENSE INSIDE THE CITY	15 000 WESTERN SUBURBS 11 500 SOUTHERN SECTOR 3 950 DPPE ASSEMBLY AREAS SOUTHERN SECTOR 30.450	IN THIS CONCEPT THE FEBA IS GENERALLY INSIDE THE METROPOLITAN BOUNDARY OF THE CITY. MAKING IT PRUDENT TO EVACUATE THE WESTERN BOUNDARY TO A DEPTH OF ABOUT 900 METERS AND THE SOUTHERN FEBA TO A DEPTH OF ABOUT 500 METERS. THREE DPPE ASSEMBLY AREAS ALSO REQUIRE RELOCATION
3 DEFEND KEY SECTORS	7 500 WESTERN SUBURBS 7 400 SOUTHERN SECTOR 3 950 DPPE ASSEMBLY AREAS 18.850	IN THIS CONCEPT THE FEBA IS OUTSIDE THE METROPOLITAN BOUNDARY OF THE CITY. THE WESTERN BOUNDARY WOULD BE EVACUATED TO A DEPTH OF ONLY 450 METERS AND ONLY THOSE CIVILIAN OCCUPIED AREAS CLOSEST TO THE FEBA IN THE SOUTHERN SECTOR WOULD REQUIRE EVACUATION
4 ENTRAPMENT AND AMBUSH	7 500 WESTERN SUBURBS 7 400 SOUTHERN SECTOR 3 950 DPPE ASSEMBLY AREAS 18.850	ALTHOUGH THE TACTICAL CONCEPTS DIFFER, THE EVACUATION RATIONALE IS THE SAME AS 3. ABOVE
5 DEFENSE IN DEPTH	SAME AS 2. ABOVE	SAME AS 2. ABOVE.
6 MOBILE DEFENSE	7 500 WESTERN SUBURBS 600 PENETRATION YOKE 7 400 SOUTHERN SECTOR 3 950 DPPE ASSEMBLY AREAS 19.450	EVACUATION REQUIREMENTS ARE SIMILAR TO THOSE FOR ENTRAPMENT AND AMBUSH. BUT IN THIS CONCEPT ONE PENETRATION AREA MAY REQUIRE ADDITIONAL EVACUATION
* IN ADDITION TO THE 34 000 RELOCATED DURING OFFENSIVE OPERATIONS		
SEE VOL I TECHNICAL REPORT FOR PHASE I GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS (BDM W 81 316-TR. MAY 14 1982) p p V 58 TO V 75 FOR GENERAL DATA AND METHODOLOGY DEVELOPED FOR CIVIL AFFAIRS IN THE OFFENSIVE PHASE		

## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

The general requirements for CA operations were analyzed with respect to each of the six defensive mission statements and operational concepts. Two CA courses of action were examined:

- Course of Action #1. VII MAF maintains minimum essential control over government officials of SYN City, the general populace, refugees and evacuees to prevent indigenous civilian interference with tactical and logistical operations.
- Course of Action #2. VII MAF augments local civilian resources until assumption of civil affairs responsibilities by follow-on forces, to provide subsistence-level rations, potable water, and emergency life-saving medical support to prevent civilian interference with tactical and logistical operations, create an environment to facilitate long-term civil affairs operations by follow-on forces insofar as possible, and provide a basis for gaining immediate intelligence information.

These courses of action are essentially the same as Courses of Action 1 and 2 for the offensive phase. The third course of action considered for the offensive phase called for a full range of civil affair operations, an option that is not feasible in the defensive phase for two reasons. First, CA Course of Action #2 was adopted by VII MAF during the offensive planning phase and the MAF's civil affairs posture on D+11 derives from earlier planning and preparations. Second, in five of the defensive missions/concepts, the FEBA is generally along or slightly to the rear of the metropolitan boundary; this provides limited space for the MAF, subjects the port and airfields to enemy interdiction and inhibits resupply and distribution activities, including that for civil affairs.

Approximately 170 8' x 8' x 20' containers or container-equivalents of food relief supplies were being offloaded at the time deliberate defensive operations were ordered. Operation Plan 1-81 called for VII MAF to begin civil affairs food support on or about D+10. That support could now be retrenched, reverting to the austere level of Course of Action #1, or implemented according to the original plan reflected in Course of Action #2. The situation facing VII MAF on D+11 militates heavily in favor of #2 for these reasons:

- Basic supplies have been provided for and are available.
- The intelligence estimate credits the enemy with the capability of attacking the GOP within 48 hours and the FEBA within 72 hours, sufficient time for VII MAF to deliver and local authorities to distribute at least a week's ration before resupply activities are rendered more difficult by expected enemy action.

- Reverting to Course of Action #1 would result in severe, widespread food shortages among the entire populace and could cause violent reactions against the MAF during crucial defensive preparations and operations.
- Course of Action #2 helps establish a significant measure of control over the populace by making them dependent on the MAF for their sustenance.
- Course of Action #2 more nearly meets the obligations imposed on commanders by international law and agreements.

The decision was made to adopt Course of Action #2. On or about D+30, the food relief supplies planned for by the follow-on forces would be shipped in to SYN City to provide a higher-calorie maintenance diet. The subsistence diet planned by VII MAF for D+11 through D+30 is shown below.

TABLE V-8 . BASIS FOR 1,500 CAL SUBSISTENCE DIET FOR SYN CITY CIVILIANS

CIVILIAN FOOD REQUIREMENTS	PER PERSON/ PER DAY	DAILY REQUIREMENT 250,000 PEOPLE	VII MAF/THEATER LEVEL OF SUPPORT PER DAY
STAPLE (cereal, rice, etc.)	350-400 grams (12.5-14.3 ounces)	97.66 to 111.64 S/T	105 S/T
ENERGY FOOD (oil, etc.)	20-40 grams (.7 - 1.4 ounces)	5.58 to 11.16 S/T	9 S/T
PROTEIN (beans, meats, veg.)	50 grams (1.8 ounces)	13.95 S/T	14 S/T
TOTAL	420-490 grams (15-17.5 ounces)	117.19 to 136.75 S/T	128 S/T

Average rations for initial survival should provide at least 6.3 megajoules (MJ) (equivalent to 1,500 kilocalories). 1 MJ = 239 Kcal. The commonly used US term for Kcal is calorie.

Additional items should be provided such as fruit, vegetables, condiments, tea, powdered milk, etc. These will be in short supply, but the Food and Agriculture Augmentation Team assigned to the 4th CAG has been directed in Oplan 6-81 to cause local authorities to bring into the city as much poultry, farm animals, and fresh produce as is feasible before defensive battles begin.

NOTE: The follow-on forces planned for a 3,200-calorie maintenance diet beginning on or about D+30. Those food relief supplies will have been programmed by DLA for delivery to SYN City in that time frame and will, therefore, be available for distribution by VII MAF, assuming that the tactical situation permits those supplies to be landed.

## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

#### Essential Activities

The following public utilities, services, and activities are important to the health and welfare of the populace. Prolonged interruption of these functions would seriously hamper MAF civil affairs efforts and impose a heavy burden on the MAF and civilian agencies attempting to provide alternative support.

- Electric Power. Electric power is provided by a 600 MW coal-fired generating plant and a 1000 MW hydro-assisted, oil-fired plant. With local businesses and industry temporarily closed down, the requirements for electric power are reduced. Appendix 7 (Intelligence Estimate) to Annex B (Intelligence) to Oplan 6-81 indicated that electric power was available for about 12 hours per day for most areas of the city as a result of repairs made by indigenous labor to damaged equipment. As long as the plants suffer no further damage and the utility employees remain on the job, the two generating plants can provide adequate power for residential areas, public agencies, and hospitals. Most hospitals, all police and fire stations, and some city government agencies have emergency power systems. Hospitals have four to five day's supply of POL, other agencies average one or two days of POL supplies. (SYN City Information Book III.E.1-7) It is probable that the generating plants will be damaged, destroyed, and/or forced to reduce services during the defensive phase. In the event that electric power is not available, the SYN City populace will be directed in the use of expedients for food preparation and personal hygiene. Total failure to provide electric power to the populace may cause unrest and agitation, but it is not a fatal condition provided that indigenous agencies comply with VII MAF civil information and public health directives. These directives would detail the establishment of decentralized messing and hygienic facilities during periods of electric blackout. Continuing resupply of POL to hospitals, public safety units, and key government agencies, however, will be essential. If local supplies of POL prove to be insufficient to meet these requirements, VII MAF will have to provide the necessary POL to assure continuity in the operations of hospitals, police and fire departments, and emergency food relief agencies. Interruption of the public radio system will make it necessary to rely on the use of posters and loudspeaker broadcasts by local officials to support the MAF civil information program.
- Potable Water. Existing water sources are adequate and the distribution system is assumed to be functioning satisfactorily enough on D+10 to meet the immediate needs of the populace.

Aggressor forces are credited with the capability of contaminating all open sources of water in SYN City, an eventuality that could result in serious health problems and epidemics that could jeopardize mission accomplishment. To meet the potential threat of wide-spread water contamination, certain precautions were taken by VII MAF planners, reflected in Annex G (Civil Affairs) to Oplan 6-81:

- 4th CAG was directed, in coordination with local authorities and using the civil information program, to require the local populace to collect and store potable water in sealed containers. A minimum of two gallons per person was specified to provide time for emergency decontamination or delivery of fresh water from offshore sources.
- CG 7th FSSG was directed to assure that potable water was available at DPRE assembly areas and to be prepared to provide 1.25 gallons of potable water per person per day for the entire populace of 250,000.
- VII MAF ACoFS G-4 was directed to arrange with the unified commander for standby emergency measures to provide potable water, to include desalinization equipment or water tankers.
- Garbage Removal. Removal of garbage on a regular basis is desirable but not imperative. Reduced rations will result in a decrease of residue, and most garbage can be buried or burned by family units. The existing SYN City garbage service will continue to function, between the hours of 0800 and 1800, except when areas are threatened by combat actions. No special measures are required apart from instructions broadcast via the VII MAF civil information program advising residents to bury or burn their garbage if service is interrupted.
- Sewerage. Appendix 7 (Intelligence Estimate) to Annex B (Intelligence) to Oplan 6-81 reflects that the three primary treatment and chlorinization plants are damaged and it may take 10 days to restore full service. Indigenous authorities should be directed to locate, confiscate, and distribute lime to subordinate food distribution points for use in preparing field-expedient head sites. Those sites can be prepared in parks, yards, or other similar areas. Sanitation precautions are necessary to limit chances of epidemics, but the measures taken and materials used should be entirely within the province of civilian agencies but with assistance from the VII MAF civil information program.

## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

#### Food Relief Storage and Distribution

Offensive Oplan 1-81 provided for the use of from one to five storage distribution points. Each point was chosen with the following characteristics in mind:

- Located centrally with respect to the population to be served, with a second consideration of accessibility.
- Located where civil authorities and agencies could unstuff containers and make further distribution to the populace via subordinate distribution sites with the least possible interference with MAF LOCs/MSRs.
- Located outside of any MAF CSSA or other facility.

Tab A (Storage/Distribution Overlay) to Appendix 6 (Food Storage/Distribution Points) to Annex G (Civil Affairs) to Operation Plan 1-81 (Offensive Phase) showed the five locations selected and described the concepts for using a single S/D point or multiple points. That tab also indicated that 80 percent of the food relief supplies would be landed in the main port area or over RED Beach and that 20 percent would be landed over BLUE Beach. Changing to a deliberate defensive posture in face of the new and increased threat makes it necessary to change the distribution plan. Five S/D points will be used to achieve dispersion of food stocks and simplify distribution. When the additional evacuation/relocation effort has been completed, approximately 85 percent of the population will be north of South River. As a consequence, 85 percent of the food relief supplies will have to be delivered to the four S/D points north of the river. Two S/D points will have to be moved from their initial sites near the FEBA to more secure locations. The S/D points are described below:

#### North of South River

<u>Number</u>	<u>Location</u>	<u>Population* Served</u>
1	Old City - Quadrangle (E11.5 - N10.5)	47,000
2	N. Central Peninsula - Soccer Field (E9.8 - N15.1)	34,000
3	Central Suburbs** (E7.3 - N9.8)	78,000

<u>Number</u>	<u>Location</u>	<u>Population*</u> <u>Served</u>
4	New City Pier (E9 - N6)	52,380
<u>South of South River</u>		
5	Naval Station Warehouse** (E8.5 - N5.2)	38,620

\* Reflects relocation of 64,500 DPRE.

\*\* Location changed from Oplan 1-81.



Figure V-4. Additional Civilian Evacuations and Food Storage/Distribution Points



## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

Civil affairs operations by MAGTFs are expected to be of limited duration, encompassing the assault and consolidation phases of an amphibious assault operation. In Phase II of this study, the shift on D+11 to a deliberate defense in the face of a new and greatly increased threat impacts on the civil affairs responsibilities of the MAF commander.

### Initial Civil Affairs Functions in SYN City

The initial CA estimate for SYN City showed that several of the 20 CA functions (FM 41-10) would have to be performed to minimize civil affairs problems, prevent civilian interference with Landing Force operations, and comply with the provisions of international law. Accordingly, Oplan 1-81 reflected that the 4th CAG was augmented with several US Army Civil Affairs Functional Teams (FM 101-10-2). The 4th CAG, in coordination with other MAF units, would perform five CA functions; US Army CA augmentation teams would coordinate seven additional CA functions; and the remaining eight functions were not considered to be required during the brief period of offensive operations.

### Civil Affairs Functions in the Offense (Oplan 1-81)\*

<u>4th CAG Capability</u>	<u>US Army Augmentation</u>	<u>Not Required</u>
Civil Information	Civilian Supply	Arts, Monuments/Archives
DPR&E	Food and Agriculture	Civil Defense
Labor	Property Control	Economics & Commerce
Public Administration	Public Communications	Public Education
Public Health	Public Safety	Public Finance
	Public Transportation	Public Welfare
	Public Works & Utilities	Religions Relations
		Tribunals

\* See Volume I; Technical Report of this study, pp. V-72/73, for CA augmentation requirements for offensive operations and Annex G (Civil Affairs) to Oplan 1-81.

### Civil Affairs Functions in SYN City in the Defense

At least two CA functions that were not required to be performed during the offensive phase will become important during the defense. The 4th CAG, as augmented in Oplan 1-81, would probably be capable of performing these functions on an ad hoc basis, but it would be preferable to have the support of specialists who are trained and experienced in these functions. An emergency request for specialist support would be in order for the following:

- Civil Defense, Team GB: 5 personnel. This team assists in the establishment, maintenance, and operation of civil defense programs for national disaster, air raid protection, and damage control. The heavy damage expected from enemy shelling and bombing will severely tax the capabilities of the two public safety teams already assigned. Therefore, the additional expertise available in a Civil Defense Team will materially improve VII MAF's capability to discharge its civil affairs responsibilities with respect to protecting the civilian population while at the same time preventing or limiting civilian interference with MAF operations.
- Public Welfare, Team VB: 4 personnel. This team provides emergency and continuing relief measures essential to public order and welfare, including the supervision and coordination of relief activities and the supervision of public and private welfare institutions, within the assigned area. The expertise available in the Public Welfare Team would be a valuable adjunct to the Civilian Supply Team that will be performing a related function.

The SYN City Information Book does not provide sufficient data to determine whether or not a Religious Relations Team is required. None was provided for in the offensive phase, but, if religious problems between military and civilian personnel in SYN City cannot be resolved satisfactorily by the chaplains assigned to VII MAF, arrangements should be made to obtain one or more 2-man Religious Relations Teams (XA). It was assumed that sufficient Aggressor linguists were available to fill the 15 Marine Fleet Assistance/Contingency language and interpreter billets in 4th CAG and to meet other VII MAF language requirements. If the number of linguists assigned to VII MAF was insufficient in the offensive phase to meet minimum-essential requirements, augmentation would be required expeditiously to meet the defensive requirements.

## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

#### Control of Civilians

Appendix 3 (Counterintelligence) to Annex B (Intelligence) to Oplan 6-81 sets forth the measures for controlling civilians. These measures include:

- Use of the existing civilian registration system for routine identification.
- Issuance of VII MAF photo identification passes to selected officials and individuals essential to the proper functioning of public safety and food relief operations. (Polaroid cameras and laminating equipment will be required by the issuing agencies.)
- Establishment of cordons sanitaire, check points, road blocks, and roving patrols.
- Enforcement of an 1800-0800 curfew for all civilians except those public safety personnel actively engaged in performing official duties.
- Establishment of a standfast policy for civilians in specific areas if the enemy attacks the FEBA.
- Monitoring of all public and commercial radio communications.
- Control of the public telephone system.
- Coordination of public safety matters by the 4th CAG Public Safety augmentation teams.
- Control of harbor traffic by Amphibious Task Force Administration Group (CTG 51.7).
- Establishment of a civil information program to inform civilians of their responsibilities.

For a discussion of security at DPRE assembly areas and the options that were considered in meeting those security requirements, see the Military Police section of this chapter.

TABLE V-9. SECURITY OPTIONS AT DPRE ASSEMBLY AREAS

OPTIONS PREFERENCE	ADVANTAGES	DISADVANTAGES	REQUIREMENTS REMARKS
1 NO SECURITY FORCE PREFERENCE 6	<ul style="list-style-type: none"> <li>DOES NOT DRAW DOWN MAF COMBAT OR SUPPORT UNITS</li> <li>FOCUSES SECURITY ON MAF INSTALLATIONS</li> </ul>	<ul style="list-style-type: none"> <li>NO CONTROL OVER DPRE MOVEMENTS ACTIONS</li> <li>RISKY IF DPRE ARE UNRULY</li> <li>ENCOURAGES LOOTING &amp; CIVIL DISORDER</li> <li>REQUIRES MORE SECURITY AT MAF POSITIONS</li> <li>DANGEROUS WHEN MAF IS HEAVILY ENGAGED IN DEFENSIVE BATTLES</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THAT CIVILIAN OCCUPIED AREAS BE CORDONED OFF</li> <li>REQUIRES EXTREMELY EFFECTIVE CIVIL INFO PROGRAM</li> <li>NOT SUITABLE EXCEPT WITH A COMPLIANT POPULATION</li> </ul>
2 LOCAL POLICE PROVIDE SECURITY FORCE PREFERENCE 5	<ul style="list-style-type: none"> <li>SAME AS ABOVE</li> <li>PROVIDES SOME DEGREE OF CONTROL</li> </ul>	<ul style="list-style-type: none"> <li>ALL OF THE ABOVE BUT TO A SLIGHTLY LESSER DEGREE</li> <li>NONEXISTENT OR INADEQUATE C</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES CLOSE MAF SUPERVISION OF THIS POLICE FUNCTION</li> <li>REQUIRES POLICE COOPERATION</li> </ul> <p>MARGINALLY SUITABLE IF PEOPLE ARE COOPERATIVE</p>
3 PROVISIONAL MAF SECURITY FORCE (OFF DUTY UNDER UTILIZED AND NOT CURRENTLY ASSIGNED TO KEY TASKS) PREFERENCE 4	<ul style="list-style-type: none"> <li>PROVIDES CONTROL OF DPRE</li> <li>USES AVAILABLE PERSONNEL</li> <li>PROVIDES SECURITY WITHOUT DRAWING DOWN COMBAT UNITS</li> </ul>	<ul style="list-style-type: none"> <li>REDUCES CSS EFFICIENCY</li> <li>LACKS ORGANIC C</li> <li>LACKS UNITY OF COMMAND</li> <li>LESS EFFICIENT THAN USING A T O UNIT</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THAT WIRE RADIO COMM BE PROVIDED</li> <li>REQUIRES COORDINATED SUPPLY SUPPORT</li> </ul> <p>FEASIBLE</p>
4 REPLACEMENT DRAFT SECURITY FORCE (USING A DETACHMENT FROM THE DRAFT) PREFERENCE 3	<ul style="list-style-type: none"> <li>SAME AS 3 ABOVE</li> <li>BRINGS SOME REPLACEMENTS IN EARLY</li> <li>PROVIDES SOME CONTINUITY UNTIL THESE SPECIFIC REPLACEMENTS ARE NEEDED IN COMBAT ROLE</li> </ul>	<ul style="list-style-type: none"> <li>DIVERTS REPLACEMENTS FROM NORMAL ROLE</li> <li>LEAVES A SECURITY VOID LATER IF WHEN REPL ARE REQUIRED</li> <li>LACKS ORGANIC C</li> <li>LACKS UNITY OF COMMAND</li> <li>LESS EFFICIENT THAN USING A T O UNIT</li> </ul>	<ul style="list-style-type: none"> <li>SAME AS ABOVE</li> </ul> <p>FEASIBLE</p>
5 RIFLE COMPANIES FROM 7TH MARDIV AS SECURITY FORCE PREFERENCE 7	<ul style="list-style-type: none"> <li>PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS</li> <li>USES T O UNIT WITH C</li> <li>DOES NOT DRAW DOWN CSS UNITS</li> <li>FACILITATES SUPERVISION CONTROL RESUPPLY</li> </ul>	<ul style="list-style-type: none"> <li>SERIOUSLY DEGRADES MAF DEFENSIVE CAPABILITY</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES A MINIMUM OF ONE BATTALION NORTH OF SOUTH RIVER AND ONE COMPANY SOUTH OF SOUTH RIVER</li> <li>REQUIRES READINESS TO CEASE SECURITY FUNCTION AND ENGAGE IN DEFENSIVE COMBAT</li> </ul> <p>NOT SUITABLE FOR THIS SITUATION</p>
6 OBTAIN EXTRA MP COMPANIES FROM FMF OR ARMY FOR SECURITY FORCE PREFERENCE 2	<ul style="list-style-type: none"> <li>ALL OF 5 ABOVE</li> <li>USES PERSONNEL TRAINED FOR THIS FUNCTION</li> <li>DOES NOT DRAW DOWN COMBAT UNITS</li> </ul>	<ul style="list-style-type: none"> <li>NOT LIKELY TO BE AVAILABLE</li> <li>IF AVAILABLE TIMELY ARRIVAL DOUBTFUL</li> <li>PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES EARLY IDENTIFICATION OF OF THE REQUIREMENT</li> <li>REQUIRES THE EQUIVALENT OF 7 MP GUARD COMPANIES UNDER BEST CASE SITUATION</li> </ul> <p>GOOD OPTION BUT PROBABLY NOT FEASIBLE</p>
7 OBTAIN ADDITIONAL RIFLE COMPANIES FROM FMF PREFERENCE 1	<ul style="list-style-type: none"> <li>PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS</li> <li>DOES NOT DRAW DOWN COMBAT OR CSS UNITS</li> <li>USES T O UNITS WITH C</li> <li>FACILITATES SUPERVISION CONTROL RESUPPLY</li> <li>PROVIDES ADDITIONAL COMBAT UNITS AND COMBAT POWER</li> </ul>	<ul style="list-style-type: none"> <li>AVAILABILITY UNCERTAIN</li> <li>PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THE EQUIVALENT OF A REINFORCED BATTALION</li> <li>REQUIRES TIMELY ARRIVAL IN AREA</li> </ul> <p>EXCELLENT OPTION BUT PROBABLY NOT FEASIBLE</p>

## Combat Service Support Functions and Requirements

### Civil Affairs (Continued)

#### Summary

- The functional augmentation of the 4th CAG that was essential for offensive combat operations in SYN City is also required in the defense, but additional expertise is highly desirable in the fields of civil defense and public welfare.
- Food relief planning for the offensive phase provided for a 1,500-calorie daily subsistence diet for the SYN City populace from D+11 through D+30, after which a 3,200-calorie maintenance diet was to be provided by follow-on forces. The VII MAF would have to make preparations for distributing the latter ration until the delayed arrival of the follow-on forces.
- Shifting to the defense in SYN City makes it necessary to evacuate up to 30,450 additional civilians from the FEBA area, thereby greatly increasing security requirements at DPRE assembly areas.
- Continuing functioning of public utilities and other services is desirable but, except for potable water, not imperative; ad hoc measures for sewage and garbage disposal can alleviate the more serious problems.
- In planning military operations in urban areas, it is important to consider the possibilities for contamination of all immediate potable-water sources. Advance preparations should be made for delivery of water or appropriate equipment either to decontaminate or produce sufficient potable water to meet military and civilian needs.
- Food relief storage and distribution points should be centrally located with respect to the populace being served and, where possible, in areas readily accessible to service support agencies. In the defense, dispersion is required.

### Recommendations

The recommendations set forth in Volume I, Technical Report, dealing with the offensive phase were reinforced during the defensive analysis. The following additional recommendations are also pertinent:

- When planning for offensive operations that will involve urban areas and essential civil affairs functions, planners should consider the likelihood that military or political considerations will make it necessary to revert to prolonged, deliberate defensive operations. The civil affairs task organization should be developed accordingly.
- Functional civil affairs teams for civil defense and public welfare, among others, were not considered essential for the offensive phase, but they are recommended for defensive operations.

## Combat Service Support Functions and Requirements

### MILITARY POLICE

DEFENSIVE OPERATIONS IN AN URBAN ENVIRONMENT INCREASE THE REQUIREMENT FOR MILITARY POLICE BEYOND THOSE ORGANIC TO THE MAF. THE GREATEST ADDITIONAL REQUIREMENT FOR MPs IS LEVIED BY CIVILIAN INTERNEE/DPRE OPERATIONS. SOLUTIONS TO THIS PROBLEM INVOLVE PROVIDING ADDITIONAL MP GUARD COMPANIES FROM FMF OR EXTERNAL SOURCES AND USING MILITARY POLICE PERSONNEL AS FORCE MULTIPLIERS TO SUPERVISE REPLACEMENT DRAFT PERSONNEL TO CONTROL DPRE.

#### General

The general organization and missions assigned to each of the MP companies organic to a MAF were outlined in Volume I of this study effort. It was also noted that MP requirements during offensive action occurring in an urban environment exceeded the capability of those MP assets normally in support of a MAF. Augmentation was recommended to satisfy the increased requirements for criminal investigation and POW/civilian internee confinement security. As VII MAF assumes a defensive posture within the SYN City metropolitan boundary, additional requirements are levied on military police assets necessitating an even greater level of MP augmentation than was required during the offensive phase.

The principal missions, related to military police operations, that must be accomplished fall into several broad categories.

- Law Enforcement--Police protection, criminal investigation, straggler control, confinement, pass and ID monitoring.
- Traffic Control--Circulation control, establishment of check points.
- POW/CI Management--Supervision of collection, guarding, evacuation.
- DPRE Management--Supervision of collection, evacuation, assembly area security.
- Security--Division and MAF CPs, key facilities, canine support.

Each of these principal missions will be analyzed in brief to ascertain the relative level of MP support necessary during defensive operations within an urban environment. As during the analysis of MP requirements occurring during the SYN City offense, the population is assumed to be overtly hostile towards the USMC presence and capable of unruly behavior and sabotage action against VII MAF activities.

Military police support for 7th MAW (Rear) will be provided by MP assets located at the TAB. These support requirements have not been delineated in this study effort as the location and nature of the TAB has not been defined. Similarly, MP requirements supporting embarkation operations in CONUS would be in addition to those within the FBH.

## Law Enforcement

Law enforcement subtasks include pass and ID monitoring, police protection, criminal investigation, straggler control, and the confinement of military personnel. The impact of urban operations is to increase MP requirements for each of these subtasks. Augmentation requirements to accomplish the increased criminal investigation workload were detailed in Volume I of this study and will not be repeated herein.

The extensive civil affairs interface necessary during the conduct of an urban defense necessitates the establishment of an ID system for key indigenous personnel who, by virtue of their respective functions, must have controlled access to designated areas within the city. Police, firemen, utility workers, and key government officials will require special identification badges/cards that will be processed by the cognizant military police element in coordination with the 4th CAG. Additional processing personnel (2-3) and consumable supplies (badges, fingerprint materials, film) should be made available to accomplish this function in a timely manner. US Army Team FG would provide the necessary augmentation to register essential civilian personnel and issue credentials.

Straggler control is a command responsibility from the outset. Unit commanders and subordinates with command responsibilities should maintain tight control of their personnel during all combat operations. Despite the tightest control, however, personnel may tend to wander away from their intended location. Whether the straggler has intentionally absented himself or has become disoriented in the urban maze, the problem of straggler control increases markedly in an urban environment which may provide shelter and sustenance aside from that provided by VII MAF. For those personnel who are merely disoriented, control measures include an initial in-country orientation briefing, disseminated city maps, fixed checkpoints, and roving patrols. On the other hand, if the straggler does not wish to be found and is willing to brave the indigenous populace then few measures are realistically available to locate and apprehend these personnel. The resources required to locate such personnel are in excess of what could be dedicated on a continuing basis.

The confinement of military prisoners is usually accomplished at facilities established ashore operated and supervised by the FSSG MP Company. Confinement rates in a nonnuclear environment generally average 1 percent of command population, or 356 personnel from VII MAF within SYN City. The MP Co FSSG will establish a detention facility for these military prisoners in the warehouse area near Old City. Security requirements range from one to two MP guard platoons. Once their disposition has been decided by judicial authorities, these prisoners will be returned to duty status or transported by surface shuttle to the TAB for further evacuation to long-term confinement facilities in CONUS.



## Combat Service Support Functions and Requirements

### Military Police (Continued)

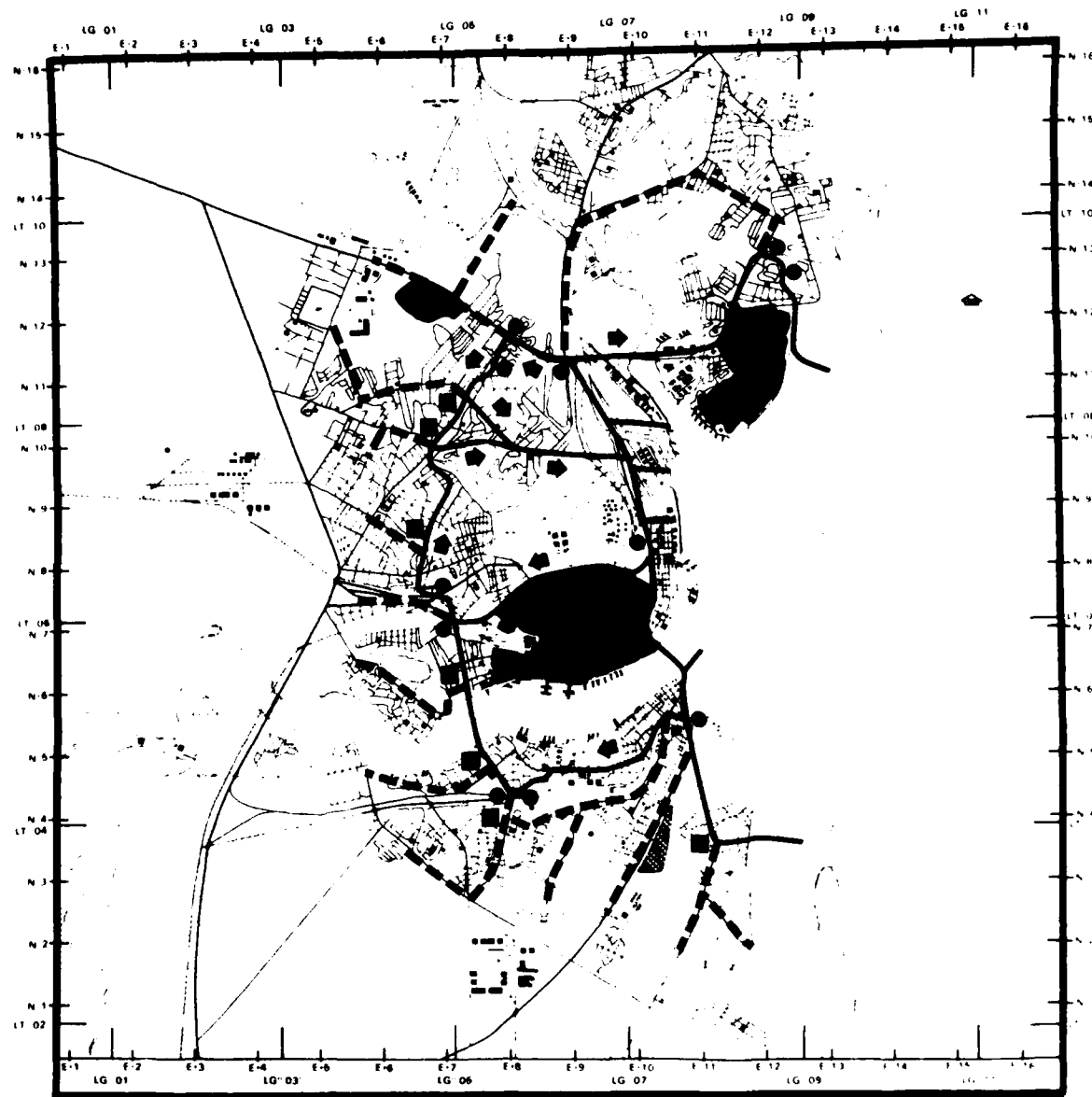
#### Traffic Control

The importance of traffic control increases significantly as VII MAF establishes defensive positions and CSS activities within SYN City. Traffic control includes the establishment and maintenance of circulation patterns as well as establishing checkpoints to curtail unauthorized movement within the city. Effective traffic control will serve to speed the delivery of critical supplies to forward units as well as provide vital health and welfare services to all personnel in SYN City. Traffic control responsibilities will be shared between divisional and FSSG military police augmented by other divisional personnel as directed.

During the early stages of the amphibious assault, traffic control was provided on an "as required" basis with traffic control measures progressively established as additional areas were consolidated. On D+10, VII MAF was ordered to defend the city against the offensive combat power of three Aggressor divisions. Additional civilians were evacuated from forward defense areas and the remaining population was ordered to remain indoors under cover--a "standfast" policy. At this point all civilian traffic except fire, police, and ration distribution was banned to clear the streets for military operations and reduce the potential for casualties among the populace.

The desired traffic circulation plan is shown in the figure opposite. A system of one-way traffic circulation has been established on primary roads connecting the CSSAs with the ISPs. Two-way traffic has been permitted on secondary roads leading from ISPs to forward positions. Traffic control checkpoints have been established at major intersections and ingress/egress points at major CSS activities. Checkpoints will maintain communication with higher headquarters and be prepared to stop and search unauthorized traffic, whether vehicular or pedestrian. Military traffic will be restricted to those primary and secondary routes delineated except when the designated routes are blocked by rubble or combat action and fire. In such instances, military police will direct traffic through streets bypassing the affected area. Unit commanders will be responsible for designating and securing routes connecting designated secondary routes with forward battle positions or supply stockage areas.

FSSG and divisional military police have been assigned 11 and 8 checkpoints respectively. Each checkpoint will be manned by 2 MPs and one additional person on each of three 8-hour shifts. The total MP requirement to man these checkpoints will involve all three traffic platoons in the MP Co FSSG and two MP platoons from the MP Co 7th MarDiv. Additional personnel will be drawn from the Landing Support Bn and divisional units in sector. Each checkpoint team should be mobile and provided with appropriate communications equipment and one light machine gun.



\*NO CIVILIAN TRAFFIC PERMITTED EXCEPT POLICE, FIRE, FOOD DELIVERY

**PRIMARY ROADS:** 4 LANE, MIN 3.5M/LANE, CIRCULATION SHOWN ➡

**SECONDARY ROADS:** 2 LANE, MIN 3.5M/LANE, TWO-WAY TRAFFIC

**MP CHECKPOINTS**

FSSG - 11 ●

MARDIV - 8 ■

Figure V-5. Traffic Circulation Plan and Checkpoint Locations  
(Mission 6 through 11)

## Combat Service Support Functions and Requirements

### Military Police (Continued)

#### POW/CI Operations

Combat operations occurring during the defense of SYN City will generate enemy POWs who must be collected, evacuated to confinement facilities, and guarded during their confinement. Additionally, a number of civilians will be interned who represent a threat to the defending force by virtue of their attitude or demonstrated actions in defiance of established civil policies. These personnel must be interned but security requirements are generally not as rigorous as those accorded POWs. Divisional MP assets will be tasked to operate the collection points and provide the resources to evacuate POW/CI from collection points to confinement facilities. External MP assets are required to guard the POW/CI during their confinement in the SYN City prison complex.

POW capture rates applicable to the SYN City defensive situation (numerically superior enemy) have not been articulated in reference sources surveyed to date. As an interim measure until more applicable data sources are found, the POW capture rate has been estimated by analysts as being on the order of one per cent of attacking enemy strength per month. It should be noted that the committed Aggressor forces are approximately equal in personnel strength to VII MAF assets within SYN City. In terms of combat capability, the enemy is superior. Based on an estimated aggregate Aggressor strength of 35,000 personnel, the POW capture rate is 350 personnel per month or an average of 12 POW per day. Internment rates for hostile civilians in a static population are given in FM 101-10-1 as being .1 to .5 percent of the total population. Refugees interned range from 2 to 5 percent of the refugee population. The total number of civilian internees is expected to range between 900 and 2,800.

POW/CI collection points will be established in each of the infantry battalion rear areas. One MP plus two additional personnel will man the collection point during each of three 8-hour shifts per day. The divisional MP company will organize an evacuation team consisting of four MP personnel which will be responsible for security during the transportation of POW/CI from collection points to the confinement facility located at the SYN City prison.

POW/CI will be confined in separate areas within the SYN City prison complex. The total confined personnel, including those confined during the SYN City offensive, number 3,650. MP Guard Companies, similar in composition to USA TO&E 19-247H, must be provided from sources external to VII MAF to accomplish the supervision and confinement of these personnel. It is estimated that 1.5 MP Guard Companies would provide the appropriate level of control.

Total military police personnel required to conduct POW/CI operations are shown in the table below. The overall requirement in this functional area has not changed significantly from that anticipated during the assault and consolidation phase of the SYN City operation. Although the number of POW and CI builds from zero at the beginning of the amphibious assault to approximately 3,650 by D+40, sufficient supervisory personnel should be provided at the beginning of the operation to handle the total POW/CI population. These personnel will act as force multipliers allowing combat assets to accomplish their mission without undue interference from a hostile population.

TABLE V-10. MP REQUIREMENTS FOR POW/CI OPERATIONS

<u>MP POW/CI SUBTASK</u>	<u>ALLOCATION OF MP ASSETS</u>	<u>APPROXIMATE SECURITY REQMT</u>	<u>ORIGIN</u>
Operate collection points	3/collection point	1 MP Plt	Internal
Evacuate POW/CI to confinement facility	12 MP/3 shifts	.5 MP Plt	Internal
Guard POW { 500-Offense 350-Defense	1 MP/16 POW	.5 MP Guard Co	External
Guard CI (2,800)	1 MP/16 CI	1.5 MP Guard Co	External

## Combat Service Support Functions and Requirements

### Military Police (Continued)

#### Security at DPRE Assembly Areas

Planning for the amphibious assault into SYN City disclosed that about 28,000 civilians would have to be evacuated from BSAs, CSSAs, and other areas. An additional 6,250 refugees were anticipated. Security requirements for the 19 DPRE assembly areas were calculated to be 1 sergeant, 4 corporals, and 16 privates at each assembly area or 399 guards plus about 60 command personnel. An alternative was identified; on a calculated risk basis the assignment of a rifle company or the equivalent from each regiment could provide the necessary security.

In the defense, an additional 30,000 civilians will have to be evacuated from the FEBA area, doubling the requirement for security guards at DPRE assembly areas at a time when the need for combat troops has increased markedly. Seven options were analyzed to determine the most feasible way in which to handle the problem of security at DPRE assembly areas. (See table opposite)

The seven options are listed in the order of least-to-most assets required. The relative preference for each option is also reflected from the standpoint of VII MAF. For example, the most desirable option to VII MAF is that of obtaining a reinforced infantry battalion in addition to the organic battalions of the 7th MarDiv. That choice would be more advantageous than any other option: it does not draw down combat or support units; it provides an organized unit with effective command, control, and communications; and it provides added combat power. The second option, using only local police as the security force is not desirable, and it would not be feasible in the face of an overtly hostile population and unruly DPRES.

Discarding the infeasible and unsuitable options, the most effective solution to the DPRE security problem is that of combining parts of options 6 and 4. One MP company, with its organic C<sup>3</sup>, should be reinforced with sufficient replacement draft personnel to meet the total DPRE security requirement. If, during defensive combat, it becomes necessary to assign these replacements to combat units, off-duty and under-utilized personnel plus those not currently assigned to key tasks can be attached to the MP Company for security duty.

TABLE V-11. SECURITY OPTIONS AT DPRE ASSEMBLY AREAS

OPTIONS PREFERENCE	ADVANTAGES	DISADVANTAGES	REQUIREMENTS REMARKS
1 NO SECURITY FORCE PREFERENCE 6	<ul style="list-style-type: none"> <li>DOES NOT DRAW DOWN MAF COMBAT OR SUPPORT UNITS</li> <li>FOCUSES SECURITY ON MAF INSTALLATIONS</li> </ul>	<ul style="list-style-type: none"> <li>NO CONTROL OVER DPRE MOVEMENTS ACTIONS</li> <li>RISKY IF DPRE ARE UNRULY</li> <li>ENCOURAGES LOOTING &amp; CIVIL DISORDER</li> <li>REQUIRES MORE SECURITY AT MAF POSITIONS</li> <li>DANGEROUS WHEN MAF IS HEAVILY ENGAGED IN DEFENSIVE BATTLES</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THAT CIVILIAN-OCCUPIED AREAS BE CORDONED OFF</li> <li>REQUIRES EXTREMELY EFFECTIVE CIVIL INFO PROGRAM</li> <li>NOT SUITABLE EXCEPT WITH A COMPLIANT POPULATION</li> </ul>
2 LOCAL POLICE PROVIDE SECURITY FORCE PREFERENCE 5	<ul style="list-style-type: none"> <li>SAME AS ABOVE</li> <li>PROVIDES SOME DEGREE OF CONTROL</li> </ul>	<ul style="list-style-type: none"> <li>ALL OF THE ABOVE BUT TO A SLIGHTLY LESSER DEGREE</li> <li>NONEXISTENT OR INADEQUATE C'</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES CLOSE MAF SUPERVISION OF THIS POLICE FUNCTION</li> <li>REQUIRES POLICE COOPERATION</li> </ul> <p>MARGINALLY SUITABLE IF PEOPLE ARE COOPERATIVE</p>
3 PROVISIONAL MAF SECURITY FORCE (OFF DUTY UNDER UTILIZED AND NOT CURRENTLY ASSIGNED TO KEY TASKS) PREFERENCE 4	<ul style="list-style-type: none"> <li>PROVIDES CONTROL OF DPRE</li> <li>USES AVAILABLE PERSONNEL</li> <li>PROVIDES SECURITY WITHOUT DRAWING DOWN COMBAT UNITS</li> </ul>	<ul style="list-style-type: none"> <li>REDUCES CSS EFFICIENCY</li> <li>LACKS ORGANIC C'</li> <li>LACKS UNITY OF COMMAND</li> <li>LESS EFFICIENT THAN USING A T O UNIT</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THAT WIRE RADIO COMM BE PROVIDED</li> <li>REQUIRES COORDINATED SUPPLY SUPPORT</li> </ul> <p>FEASIBLE</p>
4 REPLACEMENT DRAFT SECURITY FORCE (USING A DETACHMENT FROM THE DRAFT) PREFERENCE 3	<ul style="list-style-type: none"> <li>SAME AS 3 ABOVE</li> <li>BRINGS SOME REPLACEMENTS IN EARLY</li> <li>PROVIDES SOME CONTINUITY UNTIL THESE SPECIFIC REPLACEMENTS ARE NEEDED IN COMBAT ROLE</li> </ul>	<ul style="list-style-type: none"> <li>DIVERTS REPLACEMENTS FROM NORMAL ROLE</li> <li>LEAVES A SECURITY VOID LATER IF WHEN REPL ARE REQUIRED</li> <li>LACKS ORGANIC C'</li> <li>LACKS UNITY OF COMMAND</li> <li>LESS EFFICIENT THAN USING A T O UNIT</li> </ul>	<ul style="list-style-type: none"> <li>SAME AS ABOVE</li> </ul> <p>FEASIBLE</p>
5 RIFLE COMPANIES FROM 7TH MAROV AS SECURITY FORCE PREFERENCE 7	<ul style="list-style-type: none"> <li>PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS</li> <li>USES T O UNIT WITH C'</li> <li>DOES NOT DRAW DOWN CSS UNITS</li> <li>FACILITATES SUPERVISION CONTROL RESUPPLY</li> </ul>	<ul style="list-style-type: none"> <li>SERIOUSLY DEGRADES MAF DEFENSIVE CAPABILITY</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES A MINIMUM OF ONE BATTALION NORTH OF SOUTH RIVER AND ONE COMPANY SOUTH OF SOUTH RIVER</li> <li>REQUIRES READINESS TO CEASE SECURITY FUNCTION AND ENGAGE IN DEFENSIVE COMBAT</li> </ul> <p>NOT SUITABLE FOR THIS SITUATION</p>
6 OBTAIN EXTRA MP COMPANIES FROM FMF OR ARMY FOR SECURITY FORCE PREFERENCE 2	<ul style="list-style-type: none"> <li>ALL OF 5 ABOVE</li> <li>USES PERSONNEL TRAINED FOR THIS FUNCTION</li> <li>DOES NOT DRAW DOWN COMBAT UNITS</li> </ul>	<ul style="list-style-type: none"> <li>NOT LIKELY TO BE AVAILABLE</li> <li>IF AVAILABLE, TIMELY ARRIVAL DOUBTFUL</li> <li>PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES EARLY IDENTIFICATION OF OF THE REQUIREMENT</li> <li>REQUIRES THE EQUIVALENT OF 7 MP GUARD COMPANIES UNDER BEST CASE SITUATION</li> </ul> <p>GOOD OPTION BUT PROBABLY NOT FEASIBLE</p>
7 OBTAIN ADDITIONAL RIFLE COMPANIES FROM FMF PREFERENCE 1	<ul style="list-style-type: none"> <li>PROVIDES EXCELLENT CONTROL SECURITY AT DPRE ASSY AREAS</li> <li>DOES NOT DRAW DOWN COMBAT OR CSS UNITS</li> <li>USES T O UNITS WITH C'</li> <li>FACILITATES SUPERVISION CONTROL RESUPPLY</li> <li>PROVIDES ADDITIONAL COMBAT UNITS AND COMBAT POWER</li> </ul>	<ul style="list-style-type: none"> <li>AVAILABILITY UNCERTAIN</li> <li>PROBABLY NOT FEASIBLE IN LIGHT OF TOTAL USMC COMMITMENTS</li> </ul>	<ul style="list-style-type: none"> <li>REQUIRES THE EQUIVALENT OF A REINFORCED BATTALION</li> <li>REQUIRES TIMELY ARRIVAL IN AREA</li> </ul> <p>EXCELLENT OPTION BUT PROBABLY NOT FEASIBLE</p>

## Combat Service Support Functions and Requirements

### Military Police (Continued)

#### Site Security

Military police elements have traditionally augmented local security forces at division and MAF command posts (CPs) as well as key activities and installations such as ASPs, bulk fuel farms, and storage sites for sensitive supplies. The MP assets organic to the MAF are clearly not sufficient to provide the total security effort for these activities in addition to the other MP functions discussed previously. At the same time, these activities are of such importance that a nominal military police contingent is required to lend credence to the actions of other elements comprising the total security force. A populated urban area further increase the necessity of MP support at these activities.

The table below provides estimated minimum MP requirements to augment site security. Three 8-hour shifts are considered to be the norm although all personnel are subject to alert during periods of intense combat action, whether from Aggressor forces external to SYN City or the indigenous population within the city.

TABLE V-12. MP REQUIREMENTS FOR SITE SECURITY

<u>SITE</u>	<u>MPs/SHIFT</u>	<u>SOURCE</u>
MAF CP	6	External
DIVISION CP	3	MP Co MarDiv
CSSA 1	10	External
CSSA 2	6	External
ISP (4)	4	External
Sensitive Supply Storage	6	Sentry Dog Plt FSSG

### Conclusions and Recommendations

- The level of MP support normally organic to a MAF is insufficient to accomplish the required functions in the presence of a hostile population during an urban defense. In a worst-case situation with an overtly hostile populace, the estimated augmentation requirement is shown in the table below.
- The most effective way to lower the military crime rate during an urban defense is for unit commanders and supervisors to maintain close control over their personnel, thereby minimizing contact with civilians and maximizing military productivity.
- It is recommended that a composite MP Battalion be formed to coordinate the activities of organic and external MP assets. A command and control nucleus similar to USA Team AE should also be provided.
- The preferred augmentation level is 2 MP Guard Companies provided that an additional infantry battalion, less weapons company, is embarked to provide additional guard personnel for POW/CI and DPRE. Augmentation by MP Guard Companies is preferred.

TABLE V-13. AGGREGATE MP REQUIREMENTS DURING SYN CITY DEFENSE<sup>1</sup>

<u>MP TASK</u>	<u>SUBTASK</u>	<u>TOTAL MP REQMT</u>	<u>SOURCE</u>	<u>EXTERNAL AUGMENTATION REQUIRED</u>
Law Enforcement	General	1 MP Plt	1 MP Plt FSSG	-
	Guard	1 MP Guard Plt	External	1 MP Guard Plt
	ID	1 Team FG	External	1 Team FG
Traffic Control	All	5 MP Plt	3 MP Plt FSSG	-
			2 MP Plt Mar Div	-
POW/CI Mgmt	Collect	1.5 MP Plt	1.5 MP Plt Mar Div	-
	Evacuate/ Guard	2.0 MP Guard Co	External	2.0 MP Guard Co
DPRE Mgmt	All	1 MP Guard Co	External	1 MP Guard Co
Site Security	All	1 MP Co	.5 MP Plt Mar Div	-
			1 Sentry Dog Plt FSSG	2 MP Plt

Note 1 - MP support requirements at theater facilities and in CONUS supporting embarkation operations are in addition to those noted below.



## Combat Service Support Functions and Requirements

### MEDICAL SUPPORT

MEDICAL SUPPORT REQUIREMENTS FOR VII MAF IN THE DEFENSE OF SYN CITY AGAIN EXCEED THE COMBINED CAPABILITY OF THE MEDICAL BN FSSG AND CRTSS REMAINING IN THE AOA. THE MEDICAL SHORTFALL IS PARTICULARLY ACUTE IN TERMS OF BED SPACE--ADDITIONAL DEFINITIVE CARE BEDS MUST BE PROVIDED FROM OTHER ASSETS IN THE SEA ECHELON.

A moderate-to-heavy level of casualties is expected once VII MAF GOP forces begin to delay the Aggressor advance forces on D+12. The casualty level then varies in direct response to the combat situation envisioned for the remainder of the defensive action. By D+10, all units of the Medical Battalion FSSG were deployed and operational within the FBH. These units were located in CSSAs 1 and 2 and definitive medical support ashore was provided from these two locations during the SYN City offense. The change in mission and shift to a defensive posture on D+11 requires that medical support ashore be further decentralized so as to increase unit survivability and provide more responsive medical support.

The medical support concept proposed for the defense of an urban area (all five defense inside the city missions) involves the decentralization of medical support capabilities in much the same manner as for other CSS functions. Units of the Medical BN FSSG will be sited in the following locations:

- CSSA 1 - H&S Co, 1 Med Co, Hospital Co
- ISPs 2, 3, 4 - 1 Medical Co each
- CSSA 2 - 1 Medical Co

This shift in the support concept will involve the relocation of three Medical Companies from CSSAs to ISPs in order to disperse the overall capability ashore and provide definitive medical support closer to forward units. The relocation must be completed by D+14 before Aggressor lead elements close on the FEBA.

Medical support ashore will be supplemented by those CRTSSs remaining within the AOA. In a worst-case situation with other MAFs committed, the bulk of TF 51 is expected to redeploy to other locations. This redeployment will severely reduce the overall medical capability but may be necessary to support other USMC deployments. Analysts elected to redeploy the bulk of TF 51 with the following vessels remaining in support of VII MAF:

- TF 51 vessels remaining: 1 LHA-1, 1 LKA-113, 2 LPD-4, 1 LPH-2, 1 LSD-36, 2 LST-1179.
- TF 51 medical capability remaining: 11 OR, 558 definitive care beds.

Casualty estimates were prepared for each major grouping of VII MAF units located within the FBH. These estimates were based on the anticipated daily combat action for each grouping and use applicable loss rates given in FM 101-10-1. Casualties occurring at theater air facilities or aboard ATF shipping were not included in this analysis. Returns to duty were reintroduced into their respective units. The casualty estimates do not include the use of weapons producing mass casualties although the possibility of their use in this situation cannot be discounted.

The following factors were judged relevant to the determination of medical support requirements in the FBH. These factors are subject to modification based on continuing analysis but represent historical and medical experience.

- SYN City indigenous medical facilities will be fully required to serve the populace. VII MAF will not use these facilities except under emergency circumstances.
- 10% of WIA and 33% of DNBI will be treated and immediately returned to duty status.
- A 5-day AOA evacuation policy was instituted to reduce definitive care bed requirements in the AOA.
- Requirements for operating rooms (OR) were based on the number of admissions requiring surgery, ranging between 20% and 50%.
- A 1.25 spot factor was used when calculating definitive care bed requirements.
- A daily productivity of six major surgical cases per operating room was selected although this productivity could, by necessity, be greater during surge periods.

NOTE: Throughout this section the term "defensive care bed" has been used to refer to beds earmarked for resuscitative treatment and temporary hospitalization. These bed spaces are organic to the Medical Companies and Hospital Company of the FSSG Medical Battalion as well as aboard CRTSS. Additional beds may be available at each of the Battalion Aid Stations.

## Combat Service Support Functions and Requirements

### Medical Support (Continued)

#### Operating Room Requirements and Availability

Operating room requirements resulting from casualty levels in SYN City are shown in the figure below. The analysis indicates that the requirements for operating rooms exceed the capability provided by the Med Bn FSSG (18) plus CRTSs (11) if the surgery rate exceeds 26% of admissions. Options for increasing the number of available OR include the use of ORs aboard Carrier Task Force vessels, providing additional hospital companies, or providing a dedicated hospital ship. The hospital ship is the preferred option due to the lack of definitive care beds without that platform.

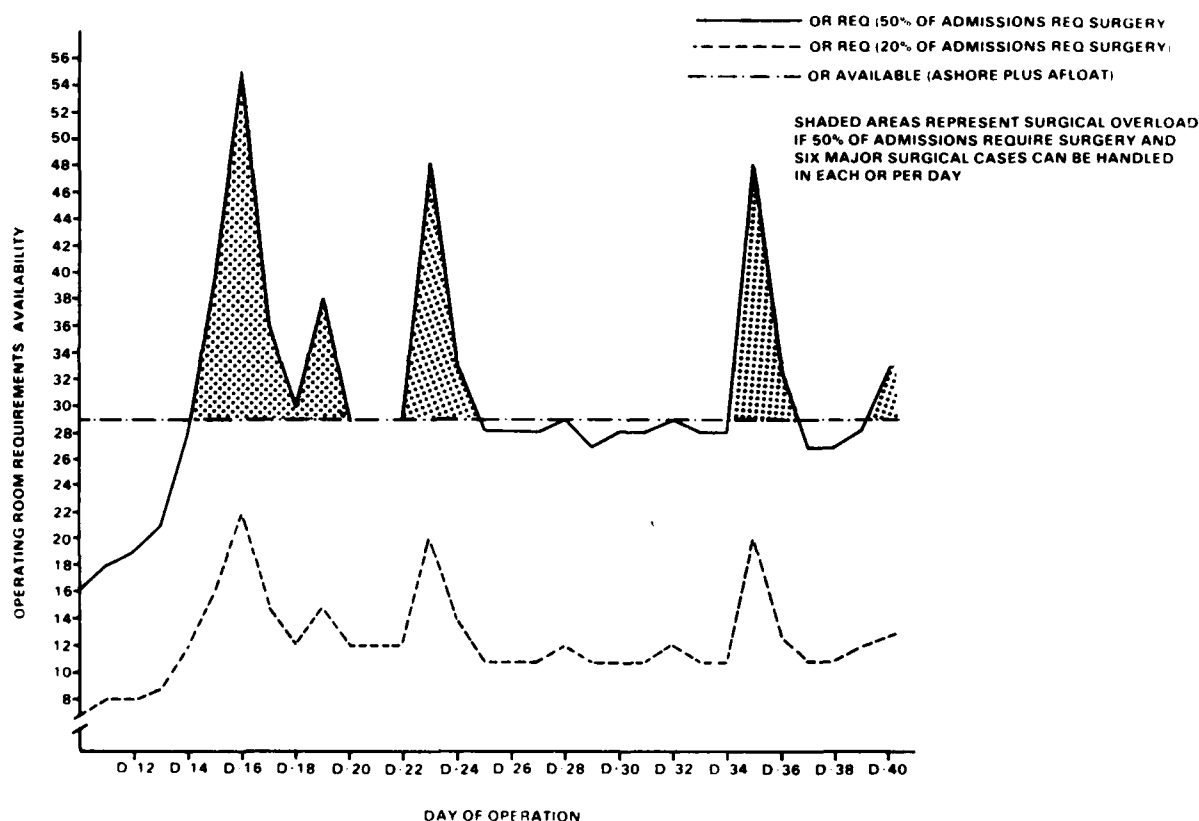


Figure V-6. Operating Room Requirements/Availability During SYN City Defense

### Bed Requirements and Availability

Requirements for definitive care beds, including a 1.25 spot factor, are shown in the figure below. Approximately 1,100 definitive care beds are available between the Medical Bn FSSG (540) and CRTSs (558). The shortfall of 1,881 beds can be alleviated by providing a hospital ship, utilizing troop bunks for less serious cases, or augmenting VII MAF with additional medical capabilities. The preferred option is to deploy a hospital ship with the ATF and utilize troop bunks for less critical patients.

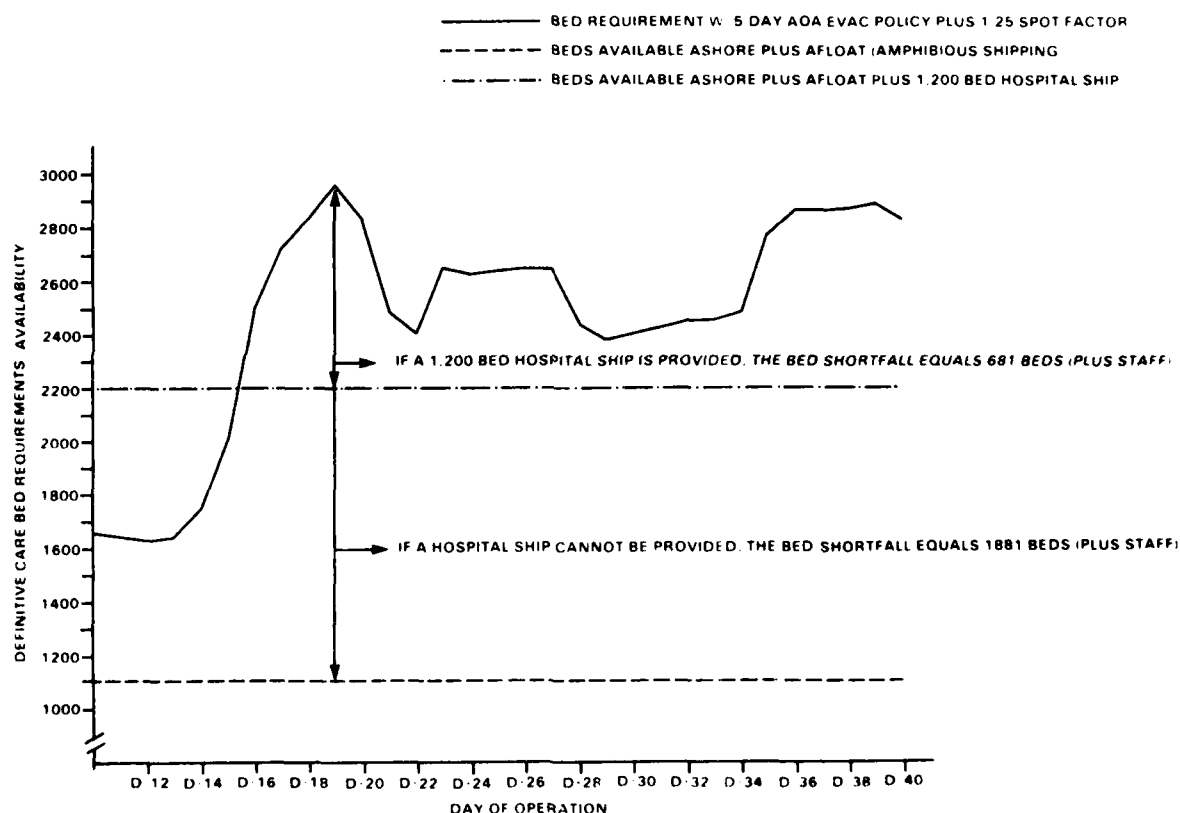


Figure V-7. Definitive Care Bed Requirements/Availability During SYN City Defense

## Combat Service Support Functions and Requirements

### Medical Support (Continued)

#### Casualty Evacuation

Each of the several echelons of casualty evacuation must be viewed in relation to the areas to be traversed and the Aggressor threat during each of those movements. For purposes of this discussion, the MAF is defending within the city and Aggressor elements have closed on the metropolitan boundary. Three distinct evacuation situations have been identified during the movement of the casualty from the front line to theater hospitals.

- Evacuation from front line to Battalion Aid Station (BAS) or Medical Company.
- Evacuation from FBH to CRTS.
- Evacuation from AOA to theater support facility.

The evacuation from the forward location to the nearest medical element ashore will be achieved through a mix of ground transport and vertical lift. The use of vertical lift will be restricted by the density of vertical obstructions as well as the proximity and location of Aggressor manportable air defense weapons. Forward units should be prepared to evacuate all casualties by ground transport once Aggressor forces have closed on the FEBA and established antiair firing positions in tall buildings on the metropolitan boundary. Ground transport vehicles used for this purpose should have litter racks installed and possess good mobility characteristics over rubble-type obstructions.

If and when the casualty requires evacuation from the FBH to a CRTS in the Sea Echelon, the preferred method is to utilize vertical lift vice surface shuttle. The distances involved (~25km) warrant the use of MEDEVAC helicopters provided that they use terrain masking until they are clear of the urban area. The seaward air defense threat has been unspecified but assumed to be such that an air shuttle from the FBH to the Sea Echelon remains a viable alternative.

The evacuation of casualties from the AOA to theater medical facilities can be accomplished by surface shuttle or vertical lift. The theater facility is assumed to be 170 nm distant from SYN City making either of these options viable. The evacuation requirement averages 268 personnel per day and will require that the evacuation be conducted using both modes of transport. Situation permitting, the more critical cases will be transported by helicopter (~1.75 hrs flight time) while the remaining personnel are transported by a surface vessel (LSD or LPD preferred) fitted with appropriate medical equipment (~8.5 hrs steaming time).

### Conclusions and Recommendations

Principal conclusions and recommendations concerning medical support for Operation BREAKER SIX are given below.

- A moderate-to-heavy level of casualties is expected in the absence of significant NBC warfare.
- Current medical equipment, systems, and operational concepts appear adequate to provide timely support in an urban defense provided that essential utility support is maintained.
- The loss of some ATF medical capability is inevitable once a portion of the Fleet redeploys to support other DON/USMC operations.
- Operating room availability ashore plus that aboard remaining CRTSs is sufficient to handle the surgical load provided that less than 26.4% of admissions require surgery. A surgical overload can be expected each time a major penetration of the FEBA occurs and counterattacks are launched to restore the FEBA.
- Bed availability is grossly deficient once a significant portion of the ATF redeploys. A dedicated hospital ship plus the use of crew bunks for less serious casualties could reduce the bed shortfall.
- Casualty evacuation within the city will be accomplished primarily by ground transport. Both surface and vertical lift will be used to evacuate casualties from the FBH to theater facilities.
- Medical support during mass casualty situations will be characterized by a total medical overload mitigated by continuing triage and evacuation.

## Combat Service Support Functions and Requirements

### MATERIALS HANDLING EQUIPMENT

THE PRIMARY FUNCTION OF MATERIALS HANDLING EQUIPMENT DURING THE VII MAF DEFENSE OF SYN CITY WILL BE TO SUPPORT CONTAINERIZED SUPPLY OPERATIONS. THE PRESENCE OF AN URBAN ENVIRONMENT IS OF SECONDARY IMPORTANCE IN COMPARISON TO CONTAINER COMPATIBILITY PROBLEMS INHERENT IN CURRENT EQUIPMENT INVENTORIES.

Materials handling considerations pertaining to the landing of the Assault Echelon and Assault Follow-On Echelon were detailed in Volume I of this study effort. This section will concentrate on the requirements for materials handling equipment to handle containerized supplies once VII MAF has assumed a defensive posture within SYN City. Two situations were judged by analysts as representing limiting cases for material handling support.

- During the period D+11 to D+16, 4 DOS of Landing Force supplies must be landed and distributed each day to build supply stocks ashore from a 3 DOS level to a 20 DOS level before Aggressor forces reach the FEBA (estimated to be early on D+16).
- After D+16, an average of 1 DOS of supplies must be handled each day to maintain stockage levels at 20 DOS.

By establishing the MHE requirement to support the handling of 4 DOS each day, sufficient flexibility is present in the system to accommodate periods of intense combat action, interdiction of ship-shore interfaces, and inclement weather when the landing of supplies is not possible or severely restricted.

The following analysis of materials handling requirements is based on the assumption that the bulk of supplies contained in the AFOE and resupply echelon is containerized to the maximum extent practicable. This situation is entirely possible during the current time period and the norm during the mid-range period. Container types and sizes to be handled include MILVANS, QUADCONS, and PALCONS.

### Key Considerations

The determination of MHE requirements during any tactical situation is based on the CSS concept employed, the level of supplies to be handled per time period, and the manner in which supplies are configured for delivery into SYN City. Equipment productivity factors obviously impact on the overall requirement and are detailed in the following subsection. While many of the assumptions underlying this methodology are unique to the SYN City defensive situation, this general methodology could be modified for application to other environments.

The CSS concept for Mission 6 - Defense Inside the City is provided in Chapter III of this Volume and involves the decentralization of supply storage in order to provide protection commensurate with the threat and prepositioning of critical supplies. The level of supplies to be landed in

Periods VI and VII is dictated by the desired level of supply stockage (20 DOS by D+15) and the number of days available to achieve that stockage goal beginning with a 3 DOS stockage on D+10.

The most critical consideration during the development of MHE requirements was the manner in which supplies are containerized for delivery into SYN City. In order to establish a worse-case requirement for MHE during the critical build-up phase between D+10 and D+15, the study team assumed that the supplies would not be in a "unit pack" configuration and would require up to several iterations of reconfiguration prior to delivery to forward combat units. Indeed, the variability of the urban defense and tactical deployments argue against the unit pack for many supply classes. In addition, it is doubtful that an "urban unit pack" will be developed and implemented within the foreseeable future. Although the bulk loading of containers will increase MHE requirements at the SYN City destination, this loading scheme in combination with the materials handling plan does provide several advantages during this defensive situation. These advantages include:

- Greater supply security within forward areas, since supplies are stored in containers,
- Reduction in quantity of damaged supplies at the using unit,
- Optimized use of available transport assets, and
- More rapid location of critical supply items.

#### Location of Materials Handling Activities

The location of and activities occurring at each CSS interface is as follows:

- Ship/Shore Interface - 20' containers (or combinations of smaller containers configured into an 8' x 8' x 20' unit) are transferred from landing craft to container-compatible semi-trailer transport. The interface may be an ELCAS, crane ship, or heavy crane at dockside.
- CSSAs - MILVAN-size containers are offloaded and marshalled. Selected supplies in QUADCON-size units are assembled and transported by 5T cargo vehicle to ISPs.
- ISPs - QUADCON-size containers are offloaded and marshalled. Selected supplies are transported to Forward Support Points located in divisional battalion rear areas.
- Forward Support Points - QUADCON/PALCON containers offloaded and supplies therein are configured into unit loads and transported to forward sites.
- Forward Sites - Supplies are offloaded and distributed to using units.

See Figure III-8 for these locations within SYN City.



## Combat Service Support Functions and Requirements

### Materials Handling Equipment (Continued)

#### General Methodology

Materials handling operations are required at the ship/shore interface, CSSAs, ISPs, Forward Support Sites (at battalion level), and Forward Sites (company level) to support the unit distribution of supplies. The overall container handling operation includes offloading, unstuffing, reconfiguring, restuffing, and reloading subtasks. The extent of each subtask depends on the manner in which the supplies are loaded into containers at embarkation points in CONUS. Analysts assumed a worst-case situation in which virtually all supplies had to be reconfigured before final delivery to forward units. The figure below shows the sequence of materials handling operations from the initial container delivery to the final pallet delivery at the using unit.

The MHE requirement is directly dependent upon the level and configuration of supplies to be handled. Container quantities, as shown in the figure opposite, were based on general day of supply planning factors and the level and type of supplies to be stocked at each supply stockage point or area. These general planning factors are thought to be sufficient for establishing baseline MHE requirements, in the absence of approved urban planning factors. (See Supply Section for additional details). Data contained in the Containerization Requirements study (Table M-5) was used to determine the number of containers required for a given tonnage of each class of supply. All containers were filled to the maximum extent possible as determined by either weight or cube limitations.

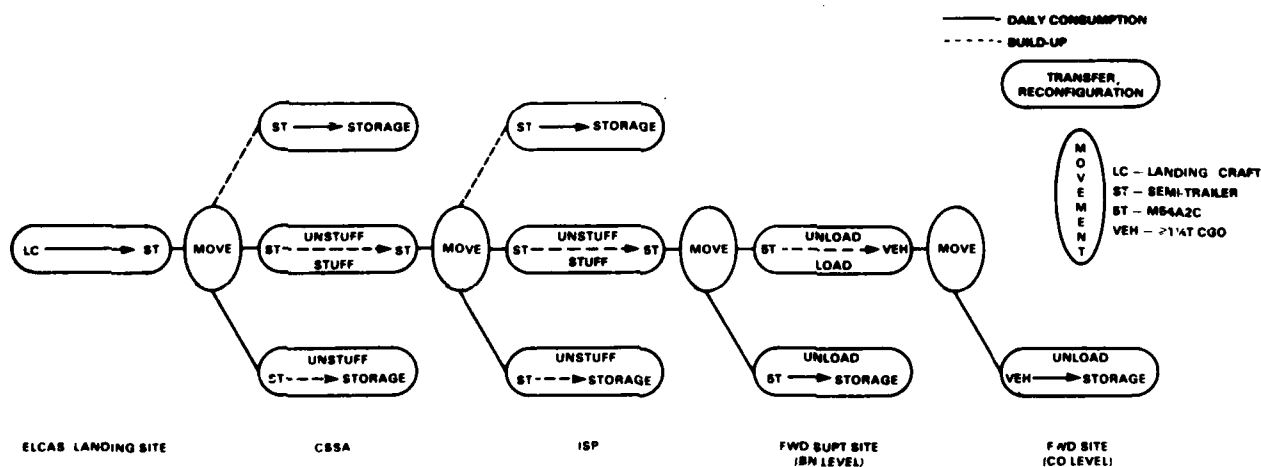


Figure V-8. Sequence of Materials Handling Operations

TABLE V-14. CONTAINERIZED SUPPLIES DELIVERED AT USING UNITS FOR 1 DOS

SUPPLY CLASS	FWD SITES (EA)			FWD SUPT SITES (EA)			ISP SITES (EA)			CSSA 1			CSSA 2		
	ST	PALLET OR PALCON	4	ST	PALCON	QUADCON	ST	QUADCON	MILVAN	ST	QUADCON	MILVAN	ST	QUADCON	MILVAN
I	141	2	4	228	1	867	3	1772	1	1	1	1	591	2	1
II	11	1	1	17	1	64	1	131	1	1	1	1	44	1	1
IV	49	1	1	79	2	299	1	611	2	1	2	1	204	1	1
V (A)						2791	2	1	1	1	1	1			
V (W)	692	7	10	1118	3	4247	1	2	2	8886	2	4	2895	2	1
VI	73	1	3	117	4	446	2	911	1	1	1	1	304	2	1
VII	176	NOT CONTAINERIZED	284	NOT CONTAINERIZED	108	NOT CONTAINERIZED	108	NOT CONTAINERIZED	2208	NOT CONTAINERIZED	736	NOT CONTAINERIZED	736	NOT CONTAINERIZED	736
VIII	26	1	1	42	2	160	1	328	2	1	1	1	109	1	1
IX	43	1	2	69	2	264	2	539	3	1	1	1	18	1	1
TOTAL	1211	14 OR 22	1954	114	114	10218	13	15185	11	6	5063	10	1		
TRUCKLOADS	4 M54A2			7 M54A2			16 M54A2 3 Semi-tri			14 M54A2 6 Semi-tri			13 M54A2 1 Semi-tri		

TABLE V-15. CONTAINERIZED SUPPLIES DELIVERED DURING BUILDUP PHASE (D+11 THROUGH D+16 4 DOS/DAY)

CLASS	LANDED			RETAINED CSSAs			RETAINED AT ISP			RETAINED FORWARD		
	ST	MILVAN	%	ST	MILVAN	%	ST	QUADCON	MILVAN	%	ST	PALCON
I	4672	33	43.2	2018	15	44.4	2074	15	12.5	584	127	
II	348	4	54.4	189	3	35.6	124	2				
IV	1612	9	43.2	896	4	44.4	716	4	12.4	200	32	
V (A)	4464	23	35.1	1567	9	65.0	2902	15				
V (W)	22928	115	43.2	9905	50	44.4	10180	52	12.5	2866	410	
VI	2408	24	77.1	1857	19	22.9	551	6				
VII	5832	NOT CONTAINERIZED	54.5	3178	NOT CONTAINERIZED	35.5	2070	NOT CONTAINERIZED				
VIII	860	9	52.1	448	5	35.5	304	4	12.6	108	31	
IX	1424	13	64.6	920	9	35.4	504	5				
TOTAL	44548	230		20778	114		19425	103		3758	600	
TRUCKLOADS	230 Semi-tri			114 Semi-tri			103 Semi-tri			100 M54A2		

## Combat Service Support Functions and Requirements

### Materials Handling Equipment (Continued)

#### Productivity Factors and Equipment Parameters

Materials handling operations during the SYN City defense will be conducted in a wide variety of functional areas and combat conditions. Climatic conditions are assumed to be generally favorable for such operations although short periods of dense fog and/or heavy rains should be anticipated. Civilian interference with materials handling operations should be minimal since all civilians have been evacuated from CSSAs, ISPs, and the Forward Defense Area. Cargo handling productivity will vary according to the conditions noted above as well as the level of training of individual equipment operators and supervisory personnel.

The variety of operational conditions under which materials handling must be accomplished led analysts to make certain assumptions concerning time requirements for MHE cycling and container contents reconfiguration. These factors represent reasonable averages with potential variances caused by day vs. night operations, combat intensity, class and type of supply handled, and operator experience. The daily duration of materials handling operations was set at 18 hours/day from D+11 through D+15 and 10 hours/day subsequent to D+15.

The urban environment is not expected to have a significant impact on required MHE operating characteristics above and beyond those currently contained in militarized MHE. The urban MHE operating environment requires the following generic characteristics:

- Capable of day/night operations with self-contained lighting equipment.
- Capable of operating in beach areas and rough terrain, including urban streets with light rubble or uneven hard surfaces.
- Capable of operating in close-quarters. Should be articulated with four-wheel steer capability.
  - Inside ISO containers.
  - Within narrow streets and cul-de-sacs.
- Equipped with silenced exhaust, standard safety equipment, roll cage, backing warning.

STUFFING/UNSTUFFING OPERATIONS

- 1 HOUR/MILVAN EQUIVALENT
- 20 MINUTES/QUADCON EQUIVALENT
- 5 MINUTES/PALCON EQUIVALENT
- ★ INCLUDES LOAD/UNLOAD TIME

HEAVY CRANE LIFT - 15 MINUTES/MILVAN EQUIVALENT

- ROUGH TERRAIN CONTAINER HANDLER (RTCH) - 50,000 LB
- ROUGH TERRAIN CRANE (RTC) - 50,000 LB @ 20'

EQUIPMENT AVAILABILITY - 80%

DAILY OPERATING TIME

- 18 HOURS (D+11 THROUGH D+15) (2 SHIFTS @ 18 HOURS)
- 10 HOURS (D+16 THROUGH D+40) (2 SHIFTS @ 10 HOURS)

FIGURE V-9 . Assumed Productivity Factors for MHE During  
SYN City Defensive Operations

## Combat Service Support Functions and Requirements

### Materials Handling Equipment (Continued)

#### MHE Requirements

Materials handling equipment requirements during the SYN City defensive period are shown in the figure opposite. The two tables are intended to give minimum and maximum MHE and MT requirements subsequent to the off-loading of AFOE units and unit T/O equipment. The actual requirement is expected to fall between these two extremes. Increased daily working times or equipment availability would reduce MHE and MT requirements although an 80% availability may itself be optimistic under extreme combat intensities involving extensive equipment damage and reduced maintenance productivities.

MHE requirements have been delineated as to CSS activity location. The maximum aggregate RTFL requirement is well within the equipment density authorized VII MAF. CG FSSG will coordinate with CG MAW to ensure that the required level of cross-support is maintained under peak conditions. Otherwise, RTFL authorized H&S and Landing Support Bns FSSG will be adequate to handle daily MHE requirements subsequent to D+15. Heavy crane (or RTCH if available) requirements can be met by LS Bn assets alone subsequent to D+15; all heavy cranes organic to VII MAF will be required from D+11 to D+15. The debarkation schedule for AFE offloading should ensure that these assets are landed prior to D+10.

The ability of VII MAF to effectively accomplish the required materials handling functions relevant to containerized supply operations will depend heavily on the procurement of heavy MHE (RTC or RTCH) designed for such operations. Current MHE inventories have a marginal capability to handle fully-loaded 20' containers and would not be capable of handling fully-loaded (by weight) 40' containers. The procurement of rough terrain containers is essential to support future USMC MAF-level logistic concepts.

Current MAF motor transport equipment densities were found to be adequate to support the distribution of supplies within the FEBA provided that a minimum of 32 container-compatible (22 1/2T) semi-trailers are procured and fielded (MT Bn Transport Co) as soon as possible.

TABLE V-16. RECOMMENDED MHE AND CARGO VEHICLE DISTRIBUTION TO ACCOMPLISH HANDLING AND MOVEMENT OF 1 DOS DURING A 10-HOUR PERIOD

ITEM	LOCATION								TOTAL
	ISP 1	FWD SUPT SITE (1)	CSSA 1	ISP 2, 3 (EA)	FWD SUPT SITES (6) (EA)	CSSA 2	ISP 4	FWD SUPT SITES (6) (EA)	
CONTAINER-COMPATIBLE SEMI-TRAILER COMBINATION	2	—	5	—	—	6	—	—	13
5T M54A2	—	3	—	19	3	—	30	2	94
RTFL (4,000-6,000 lb.)	3	2	12	6	3	9	8	2	69
HEAVY CRANE ( $\geq 30$ T)	1	1	4	2	—	2	2	—	14

TABLE V-17. RECOMMENDED MHE AND CARGO VEHICLE DISTRIBUTION TO ACCOMPLISH HANDLING AND MOVEMENT OF 4 DOS DURING AN 18-HOUR PERIOD

ITEM	LOCATION								TOTAL
	ISP 1	FWD SUPT SITE (1)	CSSA 1	ISP 2, 3 (EA)	FWD SUPT SITES (6) (EA)	CSSA 2	ISP 4	FWD SUPT SITES (6) (EA)	
CONTAINER-COMPATIBLE SEMI-TRAILER COMBINATION	4	—	13	—	—	15	—	—	32
5T M54A2	—	4	—	40	4	—	63	4	183
RTFL (4,000-6,000 lb.)	3	2	29	8	3	20	12	3	109
HEAVY CRANE ( $\geq 30$ T)	2	1	12	6	1	9	5	1	50

## Combat Service Support Functions and Requirements

### EMBARKATION

EMBARKATION REQUIREMENTS, ONCE VII MAF HAS CONSOLIDATED SELECTED AREAS IN SYN CITY AND ASSUMED A DEFENSIVE POSTURE, ARE CONCERNED WITH THE DELIVERY OF RESUPPLIES TO VII MAF AND SUBSISTENCE ITEMS FOR THE INDIGENOUS POPULACE. THE PRESENCE OF AN URBAN DESTINATION INDIRECTLY AFFECTS THIS FUNCTION IN THE TYPES OF SUPPLIES EMBARKED AND THE METHOD FOR OFFLOADING.

The embarkation section contained in Volume I of this study provided estimates of embarkation requirements and capacities for the Assault Echelon (AE) and the utilization of transport elements to debark that echelon. Embarkation requirements for the Assault Follow-On Echelon (AFOE) were noted in the materials handling section of Chapter V as were estimated requirements for debarkation transport. Once these movement echelons have been landed and offloaded, estimated to have been completed on D+15, the bulk of the embarkation function will have been satisfied. Since VII MAF has been ordered to defend SYN City until the arrival of follow-on forces, designated at higher-than-MAF level during the offensive planning phase, it is assumed that resupplies will need to be embarked and delivered to VII MAF. Furthermore, requirements exist to evacuate personnel to theater hospitals and evacuate selected damaged equipment back to fourth echelon maintenance facilities outside the SYN City AOA.

The resupply requirement for a notional MAF has been estimated (ALS Definition) to be on the order of 55,858 ST per month transported in 3,414 TEU\* with 2,694 ST breakbulk. For purposes of establishing a relative level of embarkation capacity, it is assumed that the impact of urban defensive warfare will not drastically change the composition and total weight of these resupplies. Subsistence support for the SYN City populace involves 464 container loads per month. The movement of 3,878 20' containers would require the capacity of four average size container ships each accommodating 950 to 1000 20' containers. Excess space could be used to embark breakbulk and vehicular cargo. This shipping should be divided into four movement groups arriving at the SYN City AOA at weekly intervals beginning on D+30.

The evacuation of wounded personnel to theater support facilities should be accomplished using a combination of surface shuttle and vertical lift once the use of SYN City airfields is denied by Aggressor action. This situation could occur as early as D+15 as the lead elements of the Aggressor divisions close on the SYN City metropolitan boundary. Once the airfields become untenable and evacuation by C-130/C-141 is not possible, .

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\*Twenty-foot equivalent units. This estimate is currently under revision, and ship quantities should be revised accordingly.

one of the options is to utilize LSD or LPDs, supplemented by CH-53 flights, to evacuate wounded to theater hospitals. The mix of surface transport and vertical lift is influenced by a number of factors including the threat to each transport mode, availability of transport, and the distance from SYN City to the theater facility. In this situation with the naval and air threat to VII MAF unspecified and the TAB within 170 nm of SYN City, provisions should be made for the daily departure of 1 LPD or LSD. CH-53D sorties will be used to transport urgent cases and supplement the surface evacuation.

The evacuation of unservicable equipment from the AOA to theater maintenance facilities will be accomplished on a case-by-case basis on order from CG, 7th FSSG. This retrograde requirement should be within the capability provided by the container ships and LPD/LSDs mentioned previously. Priority shipments of small items could be accommodated by vertical lift assets.

TABLE V-18. EMBARKATION REQUIREMENT--SYN CITY DEFENSE

<u>EMBARKATION REQUIREMENT</u>	<u>ORIGIN</u>	<u>DESTINATION</u>	<u>QUANTITY</u>	<u>TRANSPORT RESOURCES</u>
MOVEMENT OF RESUPPLIES	CONUS	SYN CITY	3,878 TEU/MONTH	4 CONTAINER SHIPS/MONTH
CONTAINER RETROGRADE	SYN CITY	CONUS	ABOVE	ABOVE
EVACUATION OF WOUNDED	SYN CITY	TAB	AVG 268/DAY	1 LSD or LPD, 2 CH-53D/DAY
EVACUATION OF EQUIPMENT	SYN CITY	VARIOUS	INDETERMINATE	LST, CONTAINER SHIP, CH-53



## Combat Service Support Functions and Requirements

### SUPPLY SUPPORT

AN URBAN ENVIRONMENT IMPOSES MAJOR CONSTRAINTS ON THE STORAGE AND DISTRIBUTION OF SUPPLIES DURING DEFENSIVE MISSIONS WHOLLY CONTAINED WITHIN THE CITY. THESE CONSTRAINTS NECESSITATE THE DECENTRALIZATION OF SUPPLY SUPPORT AND THE USE OF MODIFIED SUPPLY STORAGE CONCEPTS.

#### Concept of Supply Support

The following concept of supply support is applicable to each of the five missions to defend within the city. These missions have similar characteristics and the supply concept remains the same with minor modifications induced by the locations of the assumed/allowed penetrations of the FEBA. The mission to defend outside the city is dissimilar enough to the other five missions to warrant the development of other supply support concepts.

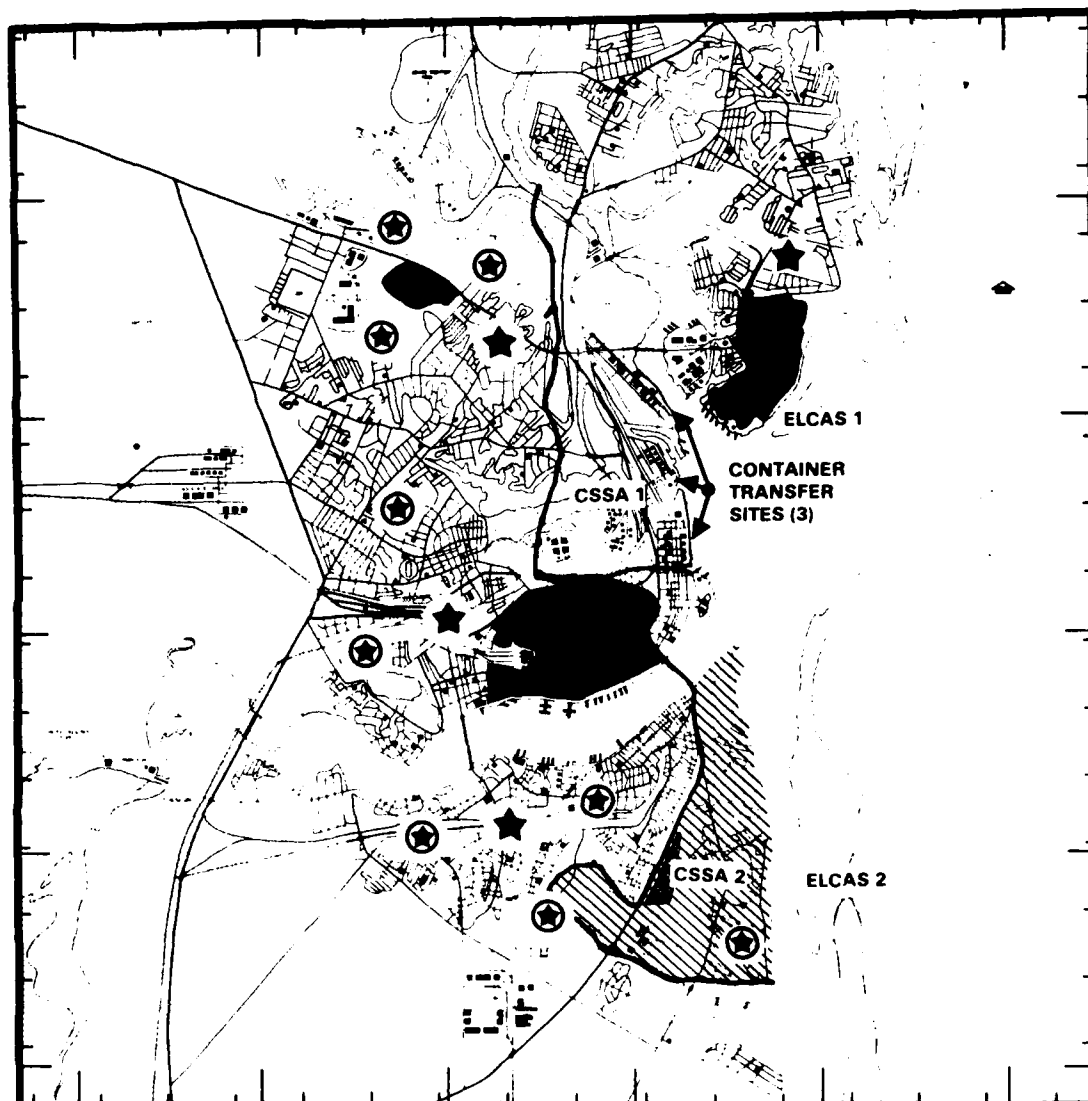
As VII MAF shifts from an offensive posture to a defensive posture within the metropolitan boundary of SYN City, several considerations arise concerning supply support and supply storage within an urban area.

- Large open land areas are generally not available for storing ammunition in accordance with area storage methods.
- All supplies stored ashore must be contained within the FEBA.
- Available structures may provide unique opportunities to disperse, store, and protect landed supplies.
- The 3 DOS established ashore by D+10 must be increased to 20 DOS by D+16 at which time Aggressor lead elements will close on the FEBA.
- The most critical consideration concerns the vulnerability and survivability of centrally located supplies (at CSSAs 1 and 2) to Aggressor indirect fire weapons.

Based on the considerations noted above, analysts concluded that supply operations should be further decentralized with stocks dispersed at selected locations throughout the city. The nature and tempo of defensive operations envisioned for VII MAF coupled with the Aggressor's capability to interdict normal resupply operations require that selected stocks be echeloned through the depth of the MAF defensive area. To provide the required dispersion while at the same time providing security for these supplies, Intermediate Support Points (ISPs) have been established at four locations as shown in the figure below. The ISPs serve as forward supply points interfacing between CSSAs and forward units.

In aggregate, the 20 DOS maintained ashore will be dispersed and stored at four echelons noted below.

- First echelon - CSSAs 1 and 2
- Second echelon - ISPs (generally one per regiment)
- Third echelon - Forward Support Points (battalion rear areas)
- Fourth echelon - Forward Stockage Points (on unit positions)



★ TENTATIVE LOCATION OF INTERMEDIATE SUPPORT POINT

⊙ TENTATIVE LOCATION OF FORWARD SUPPORT POINT

NOTE: FORWARD STOCKAGE POINTS NOT SHOWN

Figure V-10. Tentative Location of CSS Activities - Defense Inside the City

## Combat Service Support Functions and Requirements

### Supply Support (Continued)

#### Supply Stockage Levels

By D+10 when VII MAF was ordered to defend SYN City, supply stockages ashore had been built to 3 DOS. Analysts concluded that a minimum of 20 DOS of all supply classes should be maintained ashore to support the MAF defense of SYN City and provide continuous supply support should the sea lines of communication be interdicted or denied for short periods of time. During the period D+10 to D+16, supply stocks ashore will be increased to the desired level by landing and dispersing four DOS per day. The composition of each DOS is shown in the table below.

As mentioned previously, the 20 DOS will be dispersed at four echelons. The nature of the defense and the criticality of selected supplies requires that the total amount of supplies be distributed unevenly through the four echelons. This distribution and associated stockage levels are shown in the table opposite. It should be noted that the computations in this analysis were based on troop strengths on D+16 after the redeployment of the NCR and selected 7th MAW (Fwd) assets.

TABLE V-19. DAY OF SUPPLY PLANNING FACTORS

CLASS	AOA PERIOD VI	AOA PERIOD VII	TAB PERIOD VI	TAB PERIOD VII
I	138.8	110.0	40.4	45.4
II	10.3	8.3	3.0	3.4
III (A)	394,426	123,639	284,282	555,069
III (W)	279,385	223,411	5,424	6,094
IV	47.9	38.3	13.9	15.7
V (A)	229.8	111.6	162.8	281.0
V (W)	680.4	544.1	-	-
VI	71.4	57.1	20.8	23.3
VII	173.1	138.4	3.4	3.8
VIII	25.6	20.5	0.5	0.6
IX	42.3	33.8	12.3	13.8

Note:

- 1 - All figures in short tons except Class III (gallons).
- 2 - Period VI - D+11 to D+15, Period VII - D+16 to D+40.
- 3 - All calculations based on average troop strength.
- 4 - JSCP moderate intensity factor applied to AOA supplies.  
JSCP noncommitted intensity factor applied to TAB supplies.
- 5 - Class III (A) and Class V (A) based on actual squadrons.

TABLE V-20. SUPPLY STOCKAGE LEVELS AND STORAGE AREAS

SUPPLY CLASS	FORWARD DEFENSE AREA UNITS												FESQ (REP) - MAN / WND						FESQ (I) AT CESSA						STORAGE FACTOR
	PMD PMU (27)			PMD BLPT PMU (8)			ISF (A)			CESSA (TOTAL) II			ISF (A)			CESSA (TOTAL) I			CESSA 1			CESSA 2			
	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	DOE	ST	AREA	
I	2	4.3	001	3	19.5	006	10	146.5	038	5	283.2	078	13	112.8	028	7	242.6	063	16	384.4	092	5	118.1	031	0883
II	-	-	-	-	-	-	10	10.8	018	10	43.8	073	7	4.8	008	13	33.4	086	16	28.3	044	5	8.8	015	0168
III (A)	-	-	-	-	-	-	-	-	-	-	-	-	7	218K	VAR	13	1.8M	VAR	-	-	VAR	-	-	VAR	DEPENDENT UPON STORAGE METHOD
III (W)	-	-	-	#	-	-	10	300K	VAR	10	1.2M	VAR	7	120K	VAR	13	900K	VAR	16	720K	VAR	6	240K	VAR	PER SQON BASIS
IV	-	-	-	5	11.2	002	10	50.5	008	5	101.1	016	13	38.8	008	7	83.7	013	16	122.2	018	5	40.7	006	2.162
V (A)	-	-	-	-	-	-	-	-	-	-	-	-	13	382.8	3	7	781.5	7	-	-	-	-	-	-	# MODULES
V (W)	2	21.3	1	3	96.8	1	10	718.8	6	5	1437.5	12	13	962.1	5	7	1188.2	10	16	1737.2	14	6	978.1	6	30.88
VI	-	-	-	-	-	-	5	37.7	013	18	482.8	181	7	31.2	011	13	231.7	082	16	182.3	086	6	80.8	022	0846
VII	-	-	-	-	-	-	10	182.8	008	10	731.2	024	7	75.6	002	13	84.7	018	15	441.8	014	5	147.3	006	0085
VIII	-	-	-	5	6.0	001	10	27.0	008	5	84.0	012	7	11.2	002	13	83.0	018	16	86.3	014	8	21.8	006	0884
IX	-	-	-	-	-	-	10	44.6	008	10	178.8	034	7	18.5	003	13	137.2	028	15	107.9	020	5	36.0	007	0077

- II EMERGENCY STOCKS IN 55 GALLON DRUMS
- III 3/4 STORIED AT CESSA 1 1 4 STORIED AT CESSA 2
- IV BEGINNING STRENGTH ON D-15 USED TO CALCULATE DOE FACTORS

## Combat Service Support Functions and Requirements

### Supply Support (Continued)

#### Alternate Storage Concepts - Class V

During the VII MAF offensive to seize and consolidate SYN City with the mission of continuing the offense to the northwest, Class V stocks were stored in large open areas within the metropolitan boundary. The storage of 15 DOS of Class V was estimated to require 1,533 acres with the ammunition sited and stored by the area concept. As VII MAF assumes a defensive posture within the city and Class V stockage levels are increased to 20 DOS, ammunition storage by the area method no longer remains a viable option for the following reasons:

- Sufficient land areas are not available to store 20 DOS Class V by the area method.
- Ammunition storage in the defense should be decentralized but requisite storage areas are not appropriately located to support an area storage concept.
- Centralized ammunition storage areas are more easily targeted and subject to massed artillery fires.
- Security requirements for safeguarding ammunition by the area method are in excess of what VII MAF could reasonably support.

These disadvantages of the area storage method led analysts to investigate the utility of the modular storage method as a storage alternative once VII MAF assumes a defensive posture within the metropolitan boundary. TM 9-1300-206 provides detailed criteria concerning ammunition storage in the theater of operations and was used as the primary reference for the following discussion.

"In a combat zone where insufficient real estate or limited security is a guiding factor, it is often impossible to store ammunition in accordance with prescribed quantity-distance and compatibility regulations for area, roadside and area/roadside storage. Such a situation may require use of a modular system of storage for optimum safety and security commensurate with the availability of resources. In most instances this system may be the only solution for storing larger quantities in rear areas where there is insufficient real estate. In such a situation, several module blocks may be required. This method of storage is to be used only as an alternate solution when field storage methods for class 1.1 ammunition cannot be used. It should be understood that this system does not provide the degree of protection for personnel or ammunition that is afforded by regular quantity-distance dispersion. The modular cell system will be employed only when approval is granted by the major command headquarters."

TM 9-1300-206 Para 4-48d1a,b.

The modular storage method is directly applicable to those Class V items in Class I Division I (Mass-Detonating). Modules will be required at each of the ISPs as well as the CSSAs. These modules will be sited, wherever possible, so that nonflammable buildings can double as barricades between adjacent cells. Rubble or earth will be used where building patterns or construction are not suitable for use as barricades. A typical modular arrangement is shown in Figure V-12.

Class V items not included within explosive Class 1.1 will be stored in accordance with quantity-distance criteria noted in TM 9-1300-206. These items will be stored inside suitable buildings whenever possible or in separate cells from those containing Class 1.1 items. It is anticipated that the use of modular storage methods coupled with the use of buildings and rubble for barricades will serve to decrease the total engineering requirement.

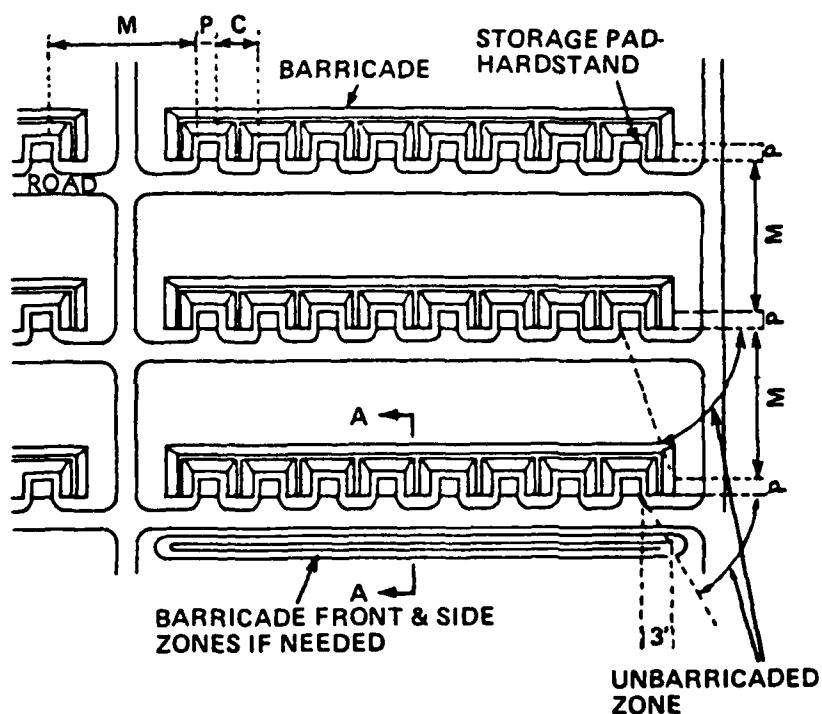
#### MODULAR STORAGE METHOD

##### ADVANTAGES

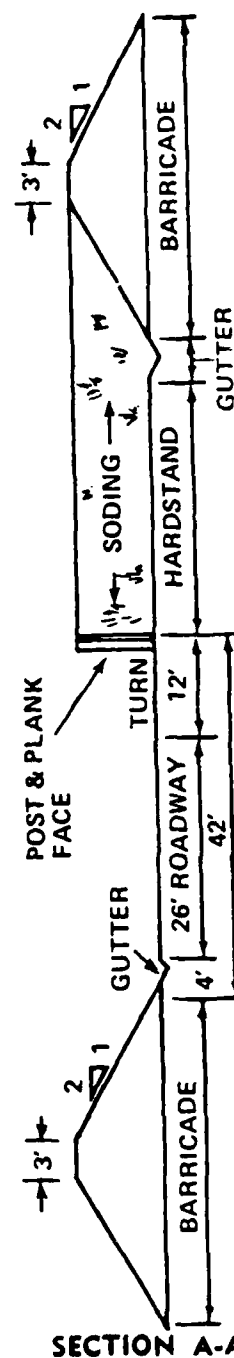
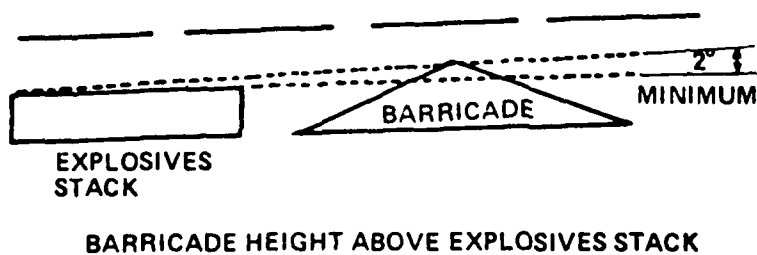
- Greatly reduced real estate requirements.
- Greatly improved security with comparable forces.
- Reduced vulnerability to direct fire on ammunition stocks.
- Potential availability of barricade materials on site (rubble).
- Reduced transportation requirement within storage area.
- Greatly reduced internal road net requirements.

##### DISADVANTAGES

- Intercellular propagation of fire by heat generation or fragment dispersion.
- Increased vulnerability to indirect fire and air attacks.
- Additional engineer support normally required to construct module barricades.

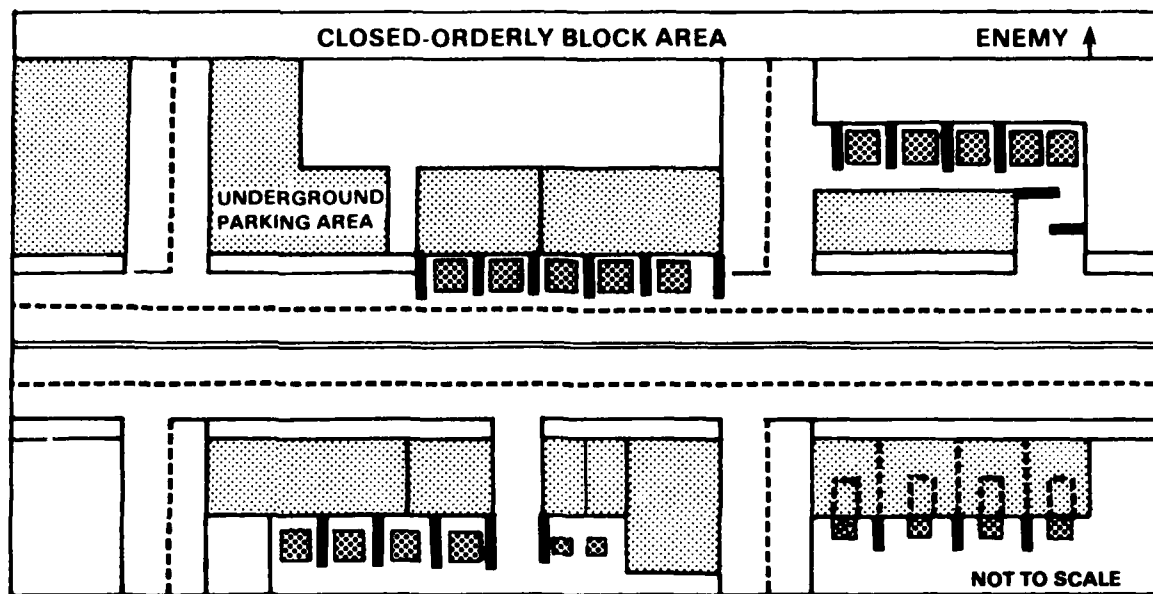


TYPICAL MAXIMUM 8 CELL MODULE  
NUMBER OF CELLS, CELL EXPLOSIVES WEIGHTS,  
PAD SIZE (P), AND DISTANCES BETWEEN CELLS  
(C) AND MODULES (M) VARY.

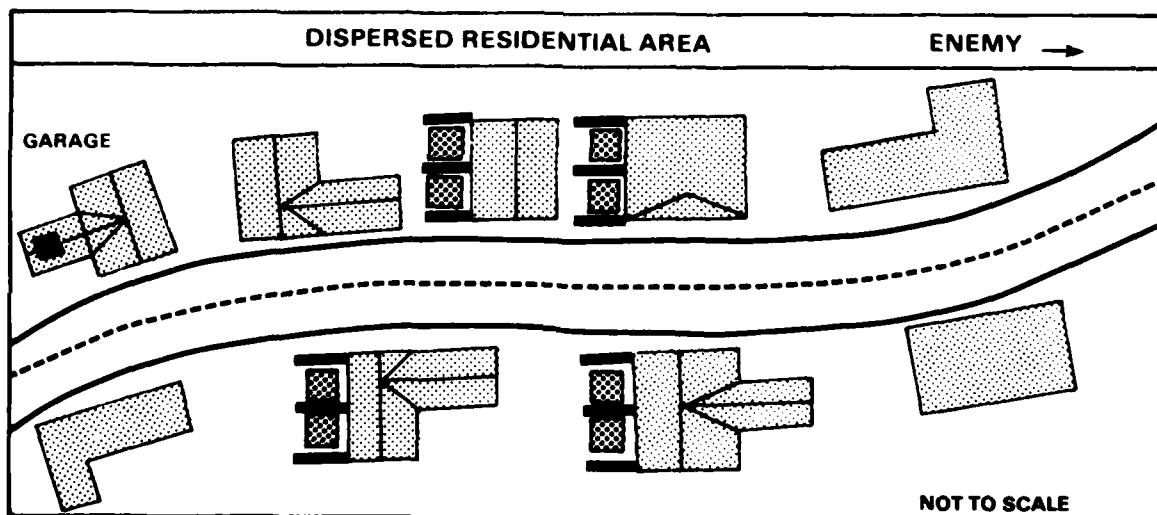


Source: TM 9-1300-206 pg. 4-39

Figure V-11. Typical 8-Cell Module (Class V Storage)



NOTE: BARRICADES MAY BE CONSTRUCTED FROM RUBBLE, ANCHORED VEHICLES OR CONTAINERS



NOTE: MASONARY BUILDINGS PREFERRED DUE TO RESISTANCE TO INCENDIARY EFFECTS



Figure V-12. Modular Class V Storage in Representative City Areas



## Combat Service Support Functions and Requirements

### Supply Support (Continued)

#### Alternate Storage Concepts - Class III

Bulk fuel storage is also a potential problem area when defending within an urban area. The availability of intact indigenous bulk fuel storage facilities should not be assumed although these facilities will be utilized when available to supplement the organic storage capability of the MAF. Typical fuel storage facilities extant in any urban area include fuel farms, gas stations, railroad tank cars, diesel locomotive servicing stations, heavy construction equipment yards, and aviation facilities. (Note: Operation of the fuel farm will likely require the assistance of key indigenous workers.) Insufficient detail is provided in the SYN City Data Base to complete an analysis of the utility of these storage facilities. For purposes of this analysis it is assumed that these facilities are not usable due to denial operations during the SYN City offense.

The fuel storage concept envisioned for all defensive missions within the city involves dispersing AAFS and TAFDS components at ISPs and CSSAs. Bladders will be contained within earthen berms or expedient frameworks and camouflaged to blend in with surrounding coloration patterns. Locations and requirements for bulk fuel storage facilities are given in the table opposite. Fuel demand was based on JSCP moderate intensity factors for ground units and daily consumption rates given in the MAGTF Lift Validation for aircraft within the FBH. Quantities indicated equal a 20 DOS for both Class III (A) and Class III (W).

As noted previously, the typical urban area may provide numerous facilities to store bulk fuel products. Many of these facilities will be damaged or denied during the course of combat operations. Other facilities will not be suitably located so as to be of value to the defending force. The following storage expedients may be of value to supplement organic MAF storage media.

- Large underground basement areas may be conducive to storing fuel provided that they are sealed and cleaned. Bladders may be located in these areas if the supporting column spacing is greater than bladder dimensions.
- Floating bulk fuel bladders (DRACONEs) holding up to 135,000 gallons apiece will be used if they are available.
- Fuel may be stored in existing fuel tanks at the bulk fuel complex or in the naval station. Lighterage and railroad tank cars could be used to hold "mobile" stocks.
- Fuel may be stored in bladders sited in large buildings with reinforced concrete flooring. Many industrial buildings, shopping centers, and municipal buildings (train station) are expected to have areas large enough to site fuel bladders.

TABLE V-21. BULK FUEL STORAGE REQUIREMENTS FOR MISSION 6

LOCATION	TYPE FUEL	FUEL QUANTITY	# AAFS @ 600K GAL	# TAFDS @ 60K GAL	DRUMS KERO	DRUMS LUBE(A)	DRUMS LUBE(W)
ISP(ea)	JP 4/5	216,692	-	4	84	24	191
	MOGAS	74,340	.2	-			
	DF-2	330,540	.6	-			
CSSA 1	JP 4/5	1,192,800	2.0	-	424	131	963
	MOGAS	375,240	.8	-			
	DF-2	1,668,440	2.8	-			
CSSA 2	JP 4/5	397,600	.8	-	188	44	428
	MOGAS	163,900	.4	-			
	DF-2	710,900	1.2	-			
	TOTAL BULK FUEL SYSTEMS		11.2	16			

- NOTE: 1. Moderate intensity factor Class III(W) = 6.28 gal/man/day
- |                    |        |
|--------------------|--------|
| 4.94 (78.7%) DF-2  | } BULK |
| 1.11 (17.7%) MOGAS |        |
| .07 (1.1%) KERO    | } DRUM |
| .158 (2.5%) LUBE   |        |
2. Moderate intensity factor Class III(A) = 8.2 gal/man/day
- |                            |
|----------------------------|
| 8.15 (99.4%) JP 4/5 - BULK |
| .05 ( 0.6%) AVLUBE - DRUM  |
3. 2/3, 1/3 split between fuels at CSSAs 1 and 2 (MOGAS, DF-2).  
3/4, 1/4 split between fuels at CSSAs 1 and 2 (JP 4/5).
4. Drummed fuel in 55 gal drums, same split as bulk fuels at CSSAs.
5. Storage requirements are applicable D+16 through D+40.

## Combat Service Support Functions and Requirements

### Supply Support (Continued)

#### Other Relevant Topics

Salvage collection points will be established in each of the ISPs as well as those already functional in each of the CSSAs. Salvage teams will include both maintenance and supply personnel operating as a contact team and equipped with mechanics' tool sets and vehicle retrievers if applicable. In an urban environment, collection may offer major problems. Civilian acquisition of unservicable material will complicate collection efforts. Further, Aggressor forces make a practice of creating killing zones covering avenues of approach for salvage and maintenance personnel. Forward units should attempt to retrograde salvage items to more secure areas before salvage operations commence. Salvage personnel should be equipped with body armor and provided with site security by elements of the forward unit in sector.

Maintenance of supply stocks while engaged in an urban defense does not differ appreciably from that maintenance generally performed in other operational environments. The AOA is located in a temperate climatic zone and Operation BREAKER SIX occurs during the summer months. Maintenance of supplies will be accomplished according to established SOPs.

PWRM stockage items applicable to urban offensive operations were noted on pgs V-134 and V-135 of Volume I. Additional items identified as applicable to the defensive posture include substantial quantities of off-route antitank mines, high explosive antiarmor grenades (HAG), demolition cratering kits, heavy wire mesh (cyclone fencing), paints similar in color to indigenous structures, CALTROPs, and water distribution line. These items should be procured and stored as part of an Urban PWRM Project Stock.

### SUPPLY CONCLUSIONS AND RECOMMENDATIONS

- Supply support should be decentralized from CSSAs with selected supplies stocked on unit positions, battalion rear areas, and other locations intermediate to the CSSAs.
- A minimum of 20 DOS of all supply classes should be stocked ashore prior to the anticipated arrival of Aggressor lead elements at the FEBA.
- Calculation of day of supply requirements should use the greater of conventional or urban planning factors to place an upper bound on the level of supplies to be landed, transported, and stored.
- Supply planning for aviation-unique items, principally Class III (A) and Class V (A) items, should be based on the actual number and type of squadrons to be supported vice lb/man/day factors.
- The number and MOS of personnel organic to the Supply Bn FSSG was found to be adequate, albeit marginally, to provide an adequate level of decentralized supply support as envisioned for Operation BREAKER SIX. Shortfalls in personnel can be alleviated by the use of excess divisional or replacement assets.
- An urban Project Stock of selected items should be included as a special reserve within PWRMS.
- Supplies should be stored indoors whenever possible to maintain adequate security and protection from Aggressor fires, civilian pilferage, and climatic conditions.
- The modular storage concept for Class V stocks should be used in an urban defense due to the reduced land area available for such purposes. Buildings, rubble, and overturned autos can be used as barricade materials. Sensitive Class V items should be stored inside buildings.
- Class III stocks should be stored in judiciously sited AAFS and TAFDS components supplemented by other expedient storage locations unique to an urban area.

## Combat Service Support Functions and Requirements

### TRANSPORTATION

TRANSPORTATION REQUIREMENTS, ONCE VII MAF HAS ESTABLISHED ITS DEFENSES WITHIN THE CITY, CENTER ABOUT THE MOVEMENT OF SUPPLIES FROM LANDING SITES TO STOCKAGE POINTS DISPERSED THROUGHOUT SYN CITY.

#### General

The transportation section in Chapter V of Volume I discussed relevant aspects of the transportation function occurring during the amphibious assault of SYN City. Transportation requirements were addressed in relation to four phases noted below:

- Phase I--Movement of LF assets to embarkation areas.
- Phase II--Movement of assault shipping to AOA.
- Phase III--Ship-to-shore movement of AE.
- Phase IV--Movement within FBHL.

Analysts concluded that Phase I and II were indirectly affected by the presence of an urban objective, while an urban area had a direct influence upon Phases III and IV of the overall transportation function. These same relationships exist once VII MAF assumes a defensive posture within the city boundaries.

Transportation requirements supporting VII MAF in the urban defense can be viewed within a framework similar to that developed during the offensive phase of the SYN City campaign. By D+16, both the AE and AFOE will have been landed but transportation requirements still exist to transport resupplies from areas within CONUS to stockage points within SYN City. The relevant phases of this transportation are noted below:

- Phase I--Movement of resupplies to embarkation areas.
- Phase II--Movement of container ships to SYN City.
- Phase III--Ship-to-shore movement of resupplies.
- Phase IV--Distribution of resupplies ashore.

As before, Phases I and II are not significantly affected by an urban destination. The movement of resupplies to embarkation areas will be accomplished by the integrated use of motor, rail, and air transport under contract to DOD. Transportation of the supplies to SYN City has been estimated (see Embarkation Section) to require assets equivalent in capacity to four average-size container ships per month. The movement of these ships will be in accordance with established procedures and will not be significantly affected by the presence of an urban objective.

### Phase III Transportation

The ship-to-shore movement of resupplies, and retrograding of other other material, will be accomplished by a mix of powered causeways, displacement landing craft (LCM 8), and air cushion landing craft (LCAC). The exact mix of these resources will depend upon the extent of assault shipping remaining in the AOA, the procurement and fielding schedule realized with the LCAC, and the number of powered causeways available. Regardless of the mix of ship-to-shore transport, the amount of resupplies that must be moved from container shipping into the port area of SYN City remains relatively constant. An estimated 3,878 20' containers plus 2,694 ST breakbulk must be transported during a monthly period. This throughput requirement averages 125 20' containers and 87 ST breakbulk moved each day during a 31-day period. It is desired that ship-to-shore transport resources be capable of moving a four-day level of resupplies per 18-hour day to allow for periods of enemy interdiction, inclement weather, and landing craft unavailability.

Within the landing craft types noted above, the powered causeway is perhaps the most versatile craft in terms of capacity, maneuverability, and overall availability. The probable departure of selected amphibious shipping from the AOA once the AE has landed will reduce the number of LCM 8 craft available to support the landing of the AFGE and resupply echelons. These craft can transport only one container in Sea States 2 to 3 and require a greater complement of personnel than other transport systems. The LCAC, with its 45 kt speed and over-the-horizon launch capability, will be used in both tactical and logistic roles, including the movement of supplies from the Sea Echelon. The powered causeway with several entrained sections (PC/W+3) can transport up to twelve containers using a crew of eight personnel with offloading accomplished by frontloaders.

The ship-to-shore planning should accommodate the movement of approximately 500 TEU plus 348 ST breakbulk per 18-hour period. Powered causeways will be used to move containerized supplies while displacement landing craft transport breakbulk cargo. LCACs will be used to supplement the container throughput when the combat situation permits. Variables in the planning process include the following for each mode-of-transport i:

- Distance of transfer point in Sea Echelon to SYN City unload point -  $D_i$ .
- Container capacity and full load speed in Sea State 2 -  $C_i, S_i$ .
- Loading time at ship interface -  $L_i$ .
- Unloading time at shore interface -  $U_i$ .
- Average "down time" per trip for maintenance, refuel, etc. -  $M_i$ .
- Operational availability -  $A_i$ .

The number of landing craft assets ( $N_i$ ) required to sustain this level of container throughput can be expressed by the following equation:

$$\sum_i 18N_i C_i / T_i = 500 \quad \text{where} \quad T_i = L_i + 2D_i / S_i + U_i + M_i$$

## Combat Service Support Functions and Requirements

### Transportation (Continued)

#### Phase IV Transportation

Phase IV of the overall transportation function is concerned with the movement of administrative items, combat elements, and resupplies once VII MAF elements have assumed defensive positions within SYN City. In this situation, all such transportation ashore will occur within the metropolitan boundary in a land area of 84 square kilometers (32.4 square miles). The relatively close spacing of combat elements will serve to decrease the total mileage accumulated during the defensive period.

Administrative transportation involves the physical movement of reports, replacement personnel, and other items administrative in nature. Transport required will range from light cargo vehicles ( $\leq 5/4T$ ) to 5T cargo vehicles provided with troop seating. It is estimated that the messenger function will require one light vehicle per company-size element per day. Wheeled transport will be utilized to move replacements, under administrative circumstances, when the total distance involved is greater than one mile. These movements will be coordinated with supply movement whenever possible to minimize the use of ground transport used for this purpose.

The movement of combat elements may either be short distance (block-to-block) or long distance (cross-city). Short distance relocations will be made on foot with cargo vehicle support when large quantities of supplies must be moved. Long distance relocations of combat elements, not provided mobility by attached amtracs, can be accomplished by ground transport (5T cargo truck) or vertical lift (CH-46 or CH-53) as appropriate to the tactical situation and antiair threat to those platforms. Once Aggressor elements have closed with the FEBA, the preferred method of movement is by ground transport. It is estimated that 10 5T cargo vehicles will be required to move personnel and weapons organic to an infantry company.

The movement and distribution of supplies from the shore interface (dock, ELCAS, bare beach) to the dispersed stockage points and forward units constitutes the most important facet of the transportation function ashore. Due to the significant antiair threat presented by manportable weapons (i.e., SA-7), this movement of supplies will be accomplished by ground transport whenever possible. Vertical lift will be used to move high-priority supplies (Class V) when suitable masked routes are available. The combat service support concept presented in Chapter III--Mission 6 and the Supply section of this chapter outline the intended disposition and distribution of supply stocks.

Associated transportation requirements fall into several categories as noted below:

- Movement and retrograde of large containers (MILVAN-size) from the shore interface to marshalling and handling areas within CSSA 1 and 2.
- Movement and retrograde of intermediate-size containers (QUADCON-size) from the CSSAs to Intermediate Support Points.
- Movement and retrograde of small containers (PALCON-size) from ISPs to locations in the Forward Defense Area.

The location of subordinate units with associated resupply requirements, the distance of each element from its supporting supply point, and the overall level of supplies to be moved per time period are the primary determinants of transportation requirements to move these supplies. The minimum required capability is to move one DOS in 10 hrs; the desired capability is to move 4 DOS in an 18-hour period. The number and type of vehicles to achieve each capability are shown in the table below for each leg of the total movement and each major movement area.

TABLE V-22. VEHICLE REQUIREMENTS TO DISTRIBUTE SUPPLIES

ORIGIN	DESTINATION	DISTANCE <sup>1</sup>	LOADS <sup>2</sup>	VEHICLES MINIMUM <sup>3</sup>	REQUIRED DESIRED <sup>4</sup>	TYPE VEHICLE
ELCAS 1 MAIN PORT ELCAS 2	ISP 1	3.0 KM	18/72 M	1	4	CONTAINER-COMPATIBLE SEMI-TRAILER WITH CAPACITY 122.5 ST
	CSSA 1	1.0 KM	114/456 M	5	11	
	CSSA 2	2.5 KM	70/280 M	6	15	
ISP 1 CSSA 1 CSSA 2	FWD SUPT SITE (1)	1.5 KM	36/72 Q	1	4	WHEELED CARGO VEHICLE WITH CROSS-COUNTRY CARGO CAPACITY 5 ST AND CARGO BED LARGE ENOUGH TO HOLD QUADCON- SIZED CONTAINER
	ISP 2, 3	4.0 KM	172/648 Q	67	79	
	ISP 4	5.0 KM	116/432 Q	30	63	
ISP 2, 3	FWD SUPT SITES (5)	1.5 KM	100/200 Q	5	14	
ISP 4	FWD SUPT SITES (4)	2.0 KM	40/200 Q	2	11	
FWD SUPT SITES	FWD SITES (15)	1.0 KM	360/720 P	3	3	
FWD SUPT SITES	FWD SITES (12)	1.0 KM	288/576 P	1	3	
	TOTAL SEMI-TRAILER			11	30	
	TOTAL ST CARGO			91	177	

Note: 1. One-way distance.  
2. Number and type of containerized loads corresponding to element: 1 DOS and buildup 4 DOS; M-MILVAN, QUADCON, P-PALCON.  
3. Minimum necessary to distribute 1 DOS in 10 hours.  
4. Vehicle requirement to distribute 4 DOS in 18 hours.



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GENERAL URBAN WARFARE AMPHIBIOUS LOGISTICS APPLICATIONS

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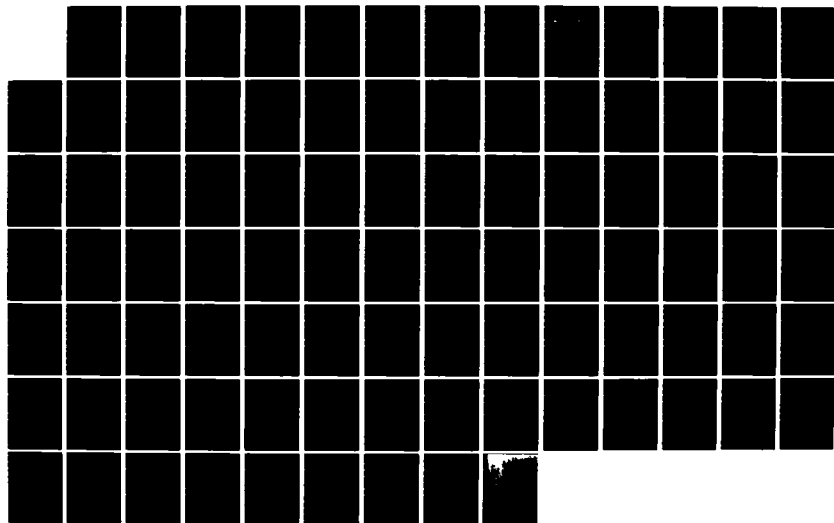
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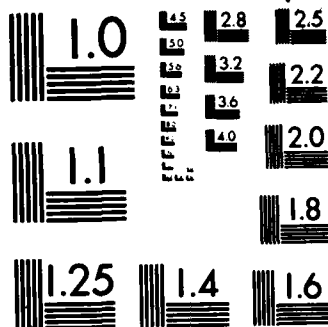
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## Combat Service Support Functions and Requirements

### LANDING SUPPORT OPERATIONS

LANDING SUPPORT OPERATIONS DURING THE SYN CITY DEFENSE WILL BE CONCERNED PRIMARILY WITH THE ESTABLISHMENT AND OPERATION OF FORWARD HLZs AND THE LANDING OF CONTAINERIZED RESUPPLIES THROUGH THE MAIN PORT AREA OR OVER ELCASs AT RED AND BLUE BEACHES.

#### General

Landing support operations during the SYN City defense, occurring from D+11 through D+40, will involve several aspects of personnel and equipment movement. The landing support situation by D+10 is as follows:

- The AE has been landed in entirety. All major units and most equipment in the AFOE has been landed. Nonessential equipment and the bulk of Landing Force supplies remain aboard ship awaiting offloading.
- The FSSG has assumed control of all landing support operations and the Shore Party Group has been dissolved. Elements comprising the LFSPG have reverted to the control of their parent units.
- The Navy Cargo Handling and Port Group (NAVCHAPGRU) and subordinate elements are assisting with the offloading of MSC shipping while the Landing Support Bn is providing personnel to accomplish shoreside container operations.

Principal landing support tasks subsequent to D+10 include HST support for GOP forces, continued support for offloading the remainder of the AFOE and any resupply echelons, and container handling support in the main port area and in the immediate vicinity of ELCASs 1 and 2 established at RED and BLUE beaches respectively. A broad delineation of landing support responsibility tasks the NAVCHAPGRU with support from the shoreside interface seaward while the Landing Support Bn accomplishes requisite support within the FBH.

Levels of effort and specific tasks for those units and elements providing landing support during Operation BREAKER ONE were addressed in Volume I of this study effort. The overall level of support is significantly greater during the D-day to D+10 time frame than during subsequent time periods. Once the AFOE has been landed, most of the personnel and equipment supporting landing operations are required within the FBH rather than aboard elevated causeways or MSC shipping. The seaside NAVCHAPGRU effort would increase accordingly with the arrival of resupply echelons, estimated to commence on or about D+40. The delivery of resupplies could occur earlier than anticipated in the event of catastrophic loss of supplies within the FBH or in shipping remaining in the Sea Echelon.

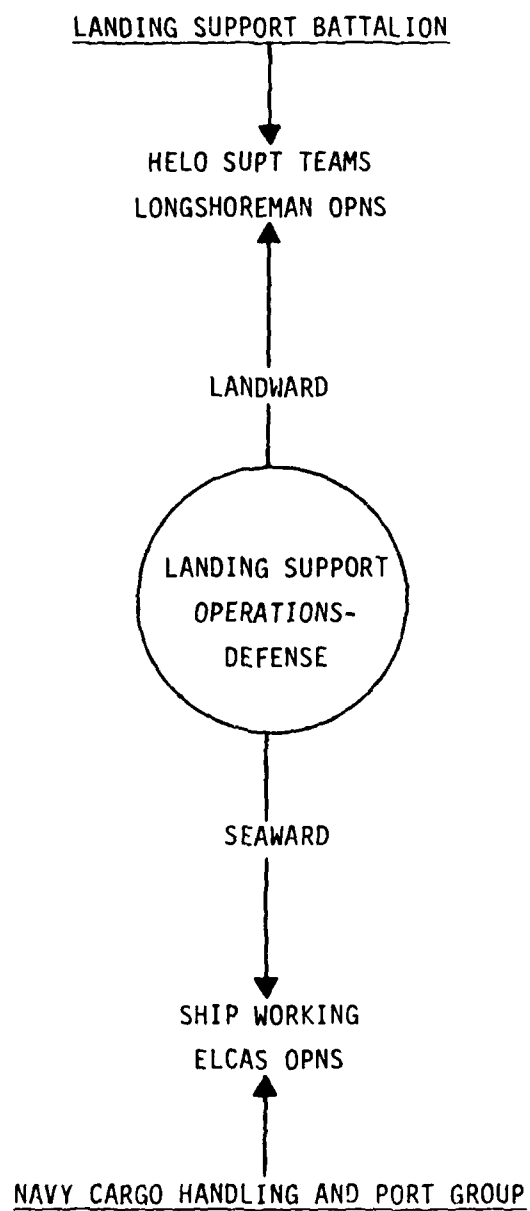


Figure V-13. Principal Tasks - Landing Support - Operation BREAKER SIX

## Combat Service Support Functions and Requirements

### Landing Support Operations (Continued)

#### Helicopter Support Teams

General information concerning the composition of helicopter support teams (HSTs) is provided in Volume I pp. V-162 to V-164 and will not be repeated herein. HSTs were structured during the early stages of the amphibious assault to provide aircraft terminal guidance and initial supply support for units helilifted into areas of SYN City not immediately supportable by other means. Similarly, during the initial stages of the SYN City defense two HSTs will be required to provide secondary supply support to MCATFs conducting operations in the MAF Security Zone. These HSTs will be dissolved when and if the GOP MCATFs are forced to withdraw inside the FEBA. Two secondary HLZs, Oak and Birch, have been provided for the insertion of reconnaissance elements, blocking units, or other forces to be designated.

Primary HLZs Maple and Spruce will be used extensively during the course of MCATF operations and HSTs at these locations have been structured to accommodate the landing and handling of a 3 DOS level of Classes I and V (W). HSTs will be provided at HLZs Oak and Birch only when these areas are utilized and then only to facilitate the actual landing of heliborne elements; no supply buildup or stockage is planned. The figure below shows the initial location of each HLZ. HST compositions are shown in the figure opposite.

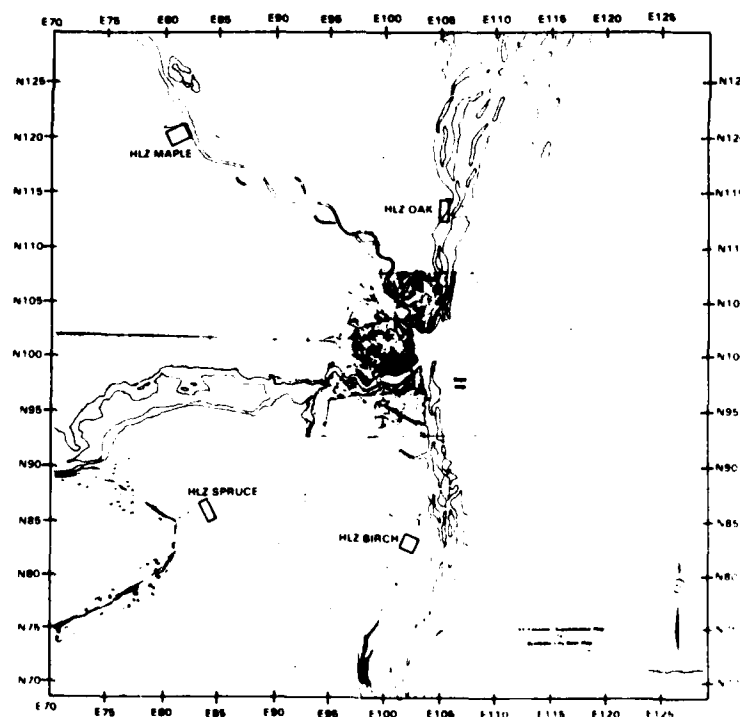
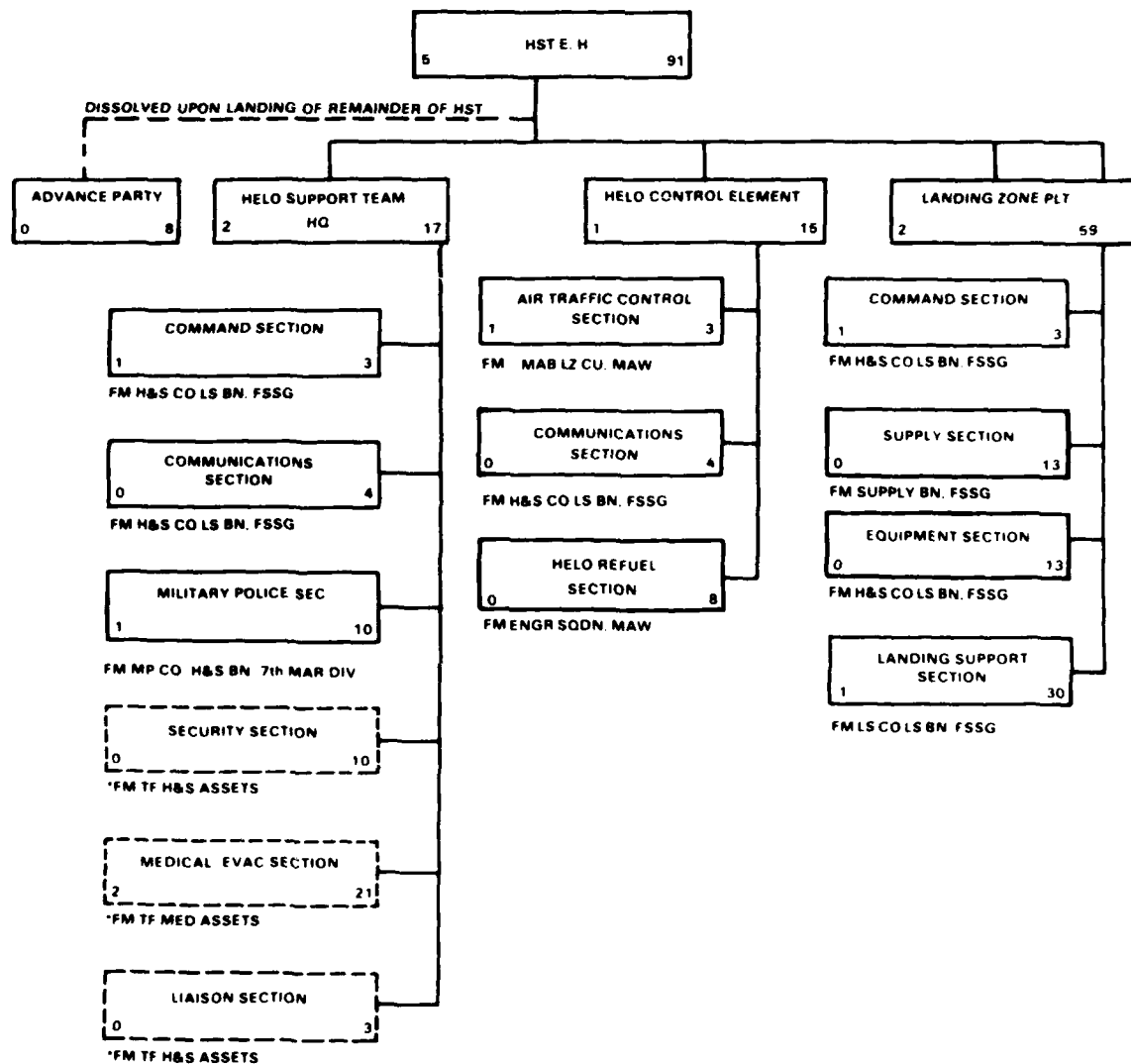


Figure V-14. Initial Locations of HLZs Outside SYN City



\*NOT COUNTED IN HST TOTAL. SUBORDINATE TO TASK FORCE ELEMENTS

Figure V-15. HST Organization (HLZs Maple, Spruce)

# Combat Service Support Functions and Requirements

## Landing Support Operations (Continued)

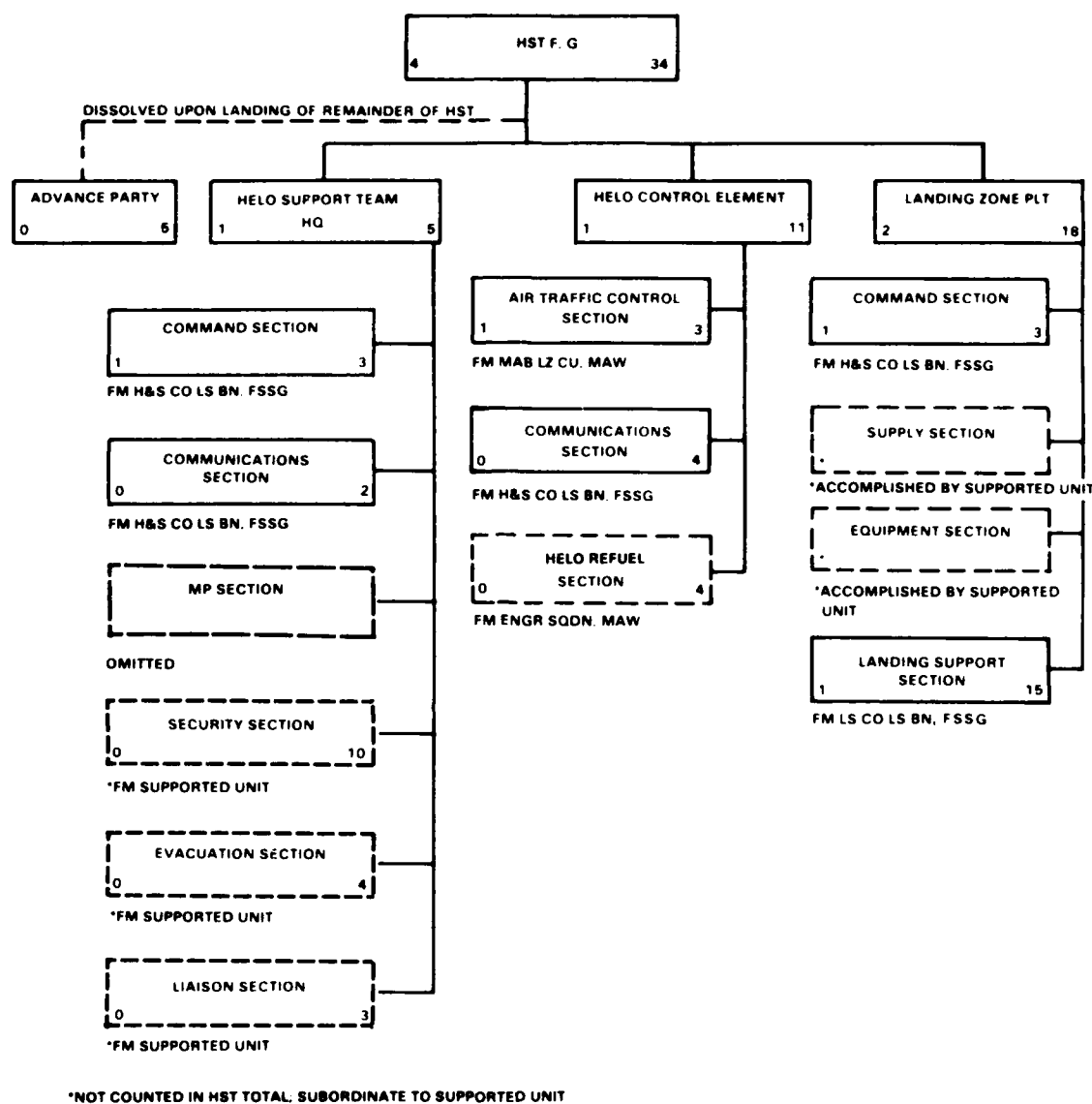


Figure V-16. HST Organization (HLZs Oak, Birch)

### Cargo Handling Operations

The movement of cargo through the port and across elevated causeways at RED and BLUE beaches will be accomplished by elements of the Landing Support Bn FSSG in conjunction with the Navy Cargo Handling and Port Group. NAVCHAPGRU Cargo Handling Bn personnel man the TCDFs (or whatever intermediary is used to interface with nonself-sustaining container ships), container ship hatches, breakbulk cargo ship hatches, and the elevated causeway systems. The Landing Support Bn provides the resources to accomplish the initial container handling and marshalling within the CSSAs. Equipment augmentation is provided by the H&S Bn FSSG (MHE) and the Motor Transport Bn FSSG.

Personnel requirements to handle cargo during defensive operations will obviously depend on the type and quantity of cargo to be moved and the time allowed to accomplish the movement. Peak requirements occur during the AFOE offloading period when both ELCAS are operational and all three container transfer sites in the main port area are being utilized. Manning levels for ship offloading operations during the AFOE landing range from 918 personnel (D+5 through D+9) to 513 personnel on D+15. (These estimates are contained in the ALS-Definition study--Table 4-3.) Shoreside personnel requirements (stevedores, checkers, supervisors) are addressed briefly in USMC Study 40-80-01--Organization and Operation of LFSP During the Mid-Range Period dated 9 November 1981. These requirements are in the process of re-evaluation at this time and subject to modification based on the results of the JLOTS testing program. Shoreside requirements in the SYN City scenario are not significantly different and the tasking of LS Bn personnel to satisfy these requirements should be based on current productivity evaluations.



## Combat Service Support Functions and Requirements

### NONTACTICAL COMMUNICATIONS\*






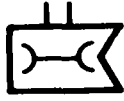








A GREATER RELIANCE WILL BE PLACED ON WIRE COMMUNICATIONS AS VII MAF DEFENDS WITHIN SYN CITY. THE USE OF MESSENGERS IS EXPECTED TO INCREASE AS THE EXTENT OF THE DEFENDED AREA DECREASES. RADIO COMMUNICATION SYSTEMS SHOULD BE ESTABLISHED SO AS TO MINIMIZE BLACKOUT AND INTERFERENCE EFFECTS CAUSED BY THE URBAN ENVIRONMENT.

Actual experience has shown that the efficiency and utility of communications systems becomes degraded when operating from within a dense urban environment. Environmental effects involving spectrum utility, line of sight, structural penetration, multi-path effects, and noise must be considered when selecting communications frequencies and antenna locations. While a greater reliance will be placed on wire communications within the urban area, the establishment of this network will be more difficult than in an open area and will require that all landlines be elevated above street level or buried in trenches running transverse to the major roadway axis. The vertical dimension in an urban area requires an increased quantity of antenna cable and telephone wire beyond that normally carried.

Volume I of this study effort noted some of the environmental considerations in an urban area as well as typical actions by Aggressor Radio Electronic Combat (REC) elements. These points are still valid, and even of greater concern, once VII MAF elements are totally deployed within the metropolitan boundary of SYN City. Table V-27, appearing on pages V-170 and V-171 of Volume I, gives communication system requirements for the FSSG once the CSSAs have been established. This basic network requires modification once the Landing Support Bn is relieved of responsibility at the CSSAs and the Intermediate Support Points are established. Principal modifications to the CSS communications system, as given in Volume I Table V-27, include a restructuring of the Landing Support Bn Control and Local Nets and the establishment of communications at each of the ISPs. The doctrinal communications structure for FSSG assets, subsequent to D+10, are shown in the figure opposite.

The effects of NBC conditions upon communications operations in general and within an urban area in particular were addressed in Volume I of this study. Recommendations set forth remain applicable to the urban defensive situation.

\* The title and the treatment of this function is in accordance with FMFM 4-1 (Draft), the document specified for contractor use over the duration of this contract. FMFM 4-1 dated 21 September 1981 has superseded the draft document and no longer includes Nontactical Communications as a CSS function.

CSSA ELEMENT	NETS MONITORED-EXTERNAL/INTERNAL	ISP ELEMENT	NETS MONITORED-EXTERNAL
	All MAF Nets/Nets 9 thru 15		Nets 9 thru 12, 15
	9, 10, 13, 14/-		-
	9, 13, 14/-		-
	9, 10, 11, 13, 14/17, 18, 19		17, 18
	9, 10, 13, 14/16		16
	9, 11, 13, 14/20		20
	9, 10, 11, 13/21, 22, 23		21, 22, 23

Note: Units will monitor other nets as directed

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1. MAF Command Nets           | 13. CSSA Local Nets                |
| 2. MAF Alert/Broadcast Net    | 14. CSSA Security Nets             |
| 3. MAF Intelligence Net       | 15. CSS Request Nets               |
| 4. MAF HST Request Net        | 16. MAF Support Party Command Net  |
| 5. MAF CSS Net                | 17. Engr Supt Bn Command Net       |
| 6. MAF Damage Control Net     | 18. Engr Co Command Nets           |
| 7. MAF Medical Regulating Net | 19. Bridge Company Command Net     |
| 8. MAF Comm Coord Net         | 20. Motor Transport Bn Command Net |
| 9. FSSG Command Nets          | 21. Medical Bn Command Net         |
| 10. FSSG Alert/Broadcast Net  | 22. Med Bn Evac Cmd Net (Ground)   |
| 11. FSSG Damage Control Net   | 23. Med Bn Evac Cmd Net (Air)      |
| 12. FSSG Comm Coord Net       |                                    |

Figure V-17. Communication System Requirements--FSSG

## Combat Service Support Functions and Requirements

### MAINTENANCE

ORGANIZATIONAL AND INTERMEDIATE LEVELS OF MAINTENANCE WILL BE ACCOMPLISHED AS FAR FORWARD AS POSSIBLE BY PERSONNEL ORGANIC TO THE USING ORGANIZATION AND FSSG MAINTENANCE CONTACT TEAMS DISPATCHED FROM ISPs AND/OR CSSAs. THE OVERALL LEVEL OF MAINTENANCE EFFORT IS NOT EXPECTED TO CHANGE SIGNIFICANTLY AS A RESULT OF URBAN DEFENSIVE COMBAT.

The basic concept for maintenance operations in an urban defensive situation is much the same as in a nonurban environment. First echelon maintenance will be accomplished by the user at his location in accordance with established procedures for that equipment item. Second echelon maintenance will be accomplished by specially trained personnel in the user organization as far forward as possible. Third echelon maintenance will be initiated by Maintenance Bn FSSG contact teams supported by decentralized intermediate-level fixed shops. Equipment requiring fourth echelon maintenance will be evacuated by surface shuttle to maintenance facilities located outside the SYN City AOA. The primary influences of defensive urban warfare upon the maintenance function are the potential availability of suitable indigenous maintenance facilities/areas and the equipment utilization patterns that result from such combat.

At the conclusion of the SYN City offensive on D+10, divisional maintenance elements had been landed and the AFOE slice of the Maintenance Battalion FSSG was in the final stages of offloading. A multi-divisional Aggressor force had begun its advance towards SYN City and VII MAF was ordered to assume a defensive posture within the city. The defensive posture adopted was similar to that outlined in Mission 6-Defense Inside the City, and provided for extensive MCATF operations in the MAF Security Zone to delay, disrupt, and destroy enemy forces thereby gaining time for VII MAF (-) to establish effective inner-city barriers and strongpoint positions.

The vulnerability of centralized FSSG maintenance facilities to interdiction once enemy forces close on the FEBA and the specific defensive posture adopted by VII MAF within the city are such that a decentralized maintenance system is expected to be more survivable and supportive under all combat conditions. The general CSS concept for Mission 6 provides for four Intermediate Support Points in addition to CSSAs 1 and 2. It is recommended that the Maintenance Battalion FSSG locate fully functional contact teams at each of the ISPs with the remainder of the battalion located at the CSSAs. The contact teams should have representation from each of the subordinate companies with the personnel and equipment composition of these "slices" based on the anticipated maintenance workload generated by the forward divisional units supported. The Maintenance Allocation Planning Study should provide guidance concerning contact team composition and rear area maintenance operations.

The level and character of maintenance operations during an urban defense will depend to a large degree upon the day-to-day combat operations used to destroy the enemy, as well as the enemy capability to disrupt MAF rear areas by long-range indirect fires and air attacks. Two distinct maintenance situations arise during the course of the SYN City defense (D+11 to D+40).

- Case 1 - D+11 to D+15
  - Maintenance support provided to GOP MCATFs by MCSSDs.
  - Maintenance Bn (-) FSSG reconfigures and deploys into ISPs and CSSAs.
- Case 2 - D+16 to D+40
  - All VII MAF units deployed within SYN City.
  - Maintenance elements have established activities at forward locations, ISPs, and CSSAs.

During the D+11 through D+15 time period, the only units in direct contact with Aggressor forces are the two MCATFs operating in the MAF Security Zone. VII MAF units remaining within SYN City are beyond the range of Aggressor artillery but still within effective range of long-range missile systems such as SCUD and FROG. Maintenance requirements are expected to be heaviest in support of GOP forces where units are in direct contact with the enemy and combat vehicles are continuously on the move over open terrain. Maintenance efforts supporting the MCATFs will by necessity be limited to minor repairs or replacement of subassemblies rather than involved system teardowns and overhauls. Equipment that cannot be repaired or retrograded to CSS activities will be cannibalized and rendered useless to Aggressor forces. Maintenance elements in the MCSSDs will carry 3 DOS of essential Class IX items; additional items or key personnel may be helilifted on site if required. Maintenance operations in SYN City during this time frame will be characterized by the replacement of parts and subassemblies necessitated by normal wear and tear. Replacement requirements for tires and windshields are expected to increase in the urban defense.

During the D+16 through D+40 time period, all VII MAF units will have deployed into SYN City and Aggressor forces will have closed on the FEBA. All areas of SYN City are subject to intense artillery bombardment and intermittent air attacks. Units in the FDA in direct contact with the Aggressor will experience heavy damage to vehicular weapons systems as well as light man-portable weapons. Damaged equipment will be retrograded to areas that offer a greater level of protection for contact team maintenance and salvage operations. Equipment will be repaired as far forward as possible consistent with the tempo of combat action. Units not located within the FDA will experience equipment damage caused by indirect fires and air attacks. Motor transport and heavy engineer equipment is especially vulnerable to such attacks. Contact teams will assess the damage and recommend the course of subsequent maintenance actions.

## Combat Service Support Functions and Requirements

### GRAVES REGISTRATION

NORMAL GRAVES REGISTRATION PROCEDURES ARE SEVERELY CONSTRAINED WHEN A DEFENDING FORCE IS DEPLOYED WITHIN THE METROPOLITAN LIMITS OF A DENSELY POPULATED AREA. IN ADDITION, PUBLIC OPINION PRESSES FOR THE IMMEDIATE RETURN TO CONUS OF ALL KIA.

The graves registration program is one facet of the overall care of servicemen killed in action. The program involves the search for, recovery, identification, temporary interment and disinterment of deceased personnel. When the temporary interment occurs in a forward combat zone, the task of cemetery maintenance is included within this program. Other programs relevant to the care of the dead include the following:

- Current death program--Preparation of remains, including embalming, and permanent disposition.
- Return of remains programs--Recovery and return of remains temporarily interred or not recovered during hostilities.
- Concurrent death program--Recovery, identification, embalming, and return of remains for permanent disposition. This program is a combination of the graves registration and current death programs.

Volume I of this study outlined criteria for temporary interment in a combat zone. These criteria cannot be met with any assurance within the SYN City metropolitan boundary during the course of the defense of that area. Accordingly, the concurrent death program concept proposed during the offensive phase provided for the recovery, preliminary identification, and immediate evacuation of the deceased to the theater air base (170 nm distant) where final identification, embalming, and CONUS evacuation would occur. Temporary storage in SYN City, as a buffer should evacuations be delayed, would be accomplished using ships' morgues, available indigenous refrigerated lockers, and reefer containers. This overall concept remains the preferred course of action during the defense of SYN City. Evacuations to the TAB could be accomplished by surface shuttle (LPD) and/or V/STOL aircraft. The remainder of this section will deal with those aspects of the graves registration function accomplished in SYN City by elements of VII MAF. Other aspects of the current death program are addressed in the "Medical and Dental Support System (1984-1993) (U) Volume II (SECRET)".

The Graves Registration (GR) Platoon will be deployed with the platoon (-) located at CSSA 1 and one section located at CSSA 2 for all tactical missions involving defense within the city. Deceased and their personal effects will be recovered by unit personnel who will place the remains in a secure area and notify the graves registration section at the nearest CSSA. A collection detail from the GR section, consisting of 2 EM and one 5T

cargo truck equipped with litter racks and bowed canvas, will transport the remains and personal effects from the unit location to the CSSA. Graves registration personnel at the CSSA will complete the identification and processing prior to evacuation by ship or aircraft.

The figure below shows the graves registration workload by day for the course of the SYN City defense. VII MAF personnel killed in action within SYN City range from a daily peak of 122 to a low of 53 averaging to 61.6 KIA per day. The most critical aspect of the graves registration function accomplished in SYN City is the identification of the deceased prior to evacuation. Under average conditions, one graves registration specialist (MOS 9051) can handle the identification of 16 deceased in a 10-hour period. Each of the four GR sections has one MOS 9051 currently authorized; the GR Plt Hq has an additional MOS 9051 billet. These personnel are insufficient to handle the daily identification workload envisioned during the SYN City defense. It is recommended that one dental technician billet be added to the platoon headquarters. In addition, one of the shore party billets in each GR section should be changed to a LCpl MOS 9051 billet thus providing an identification capability commensurate with surge conditions and the potential attrition of GR specialists. (The Medical/Dental study previously referred to made essentially these same recommendations in an unclassified section.)

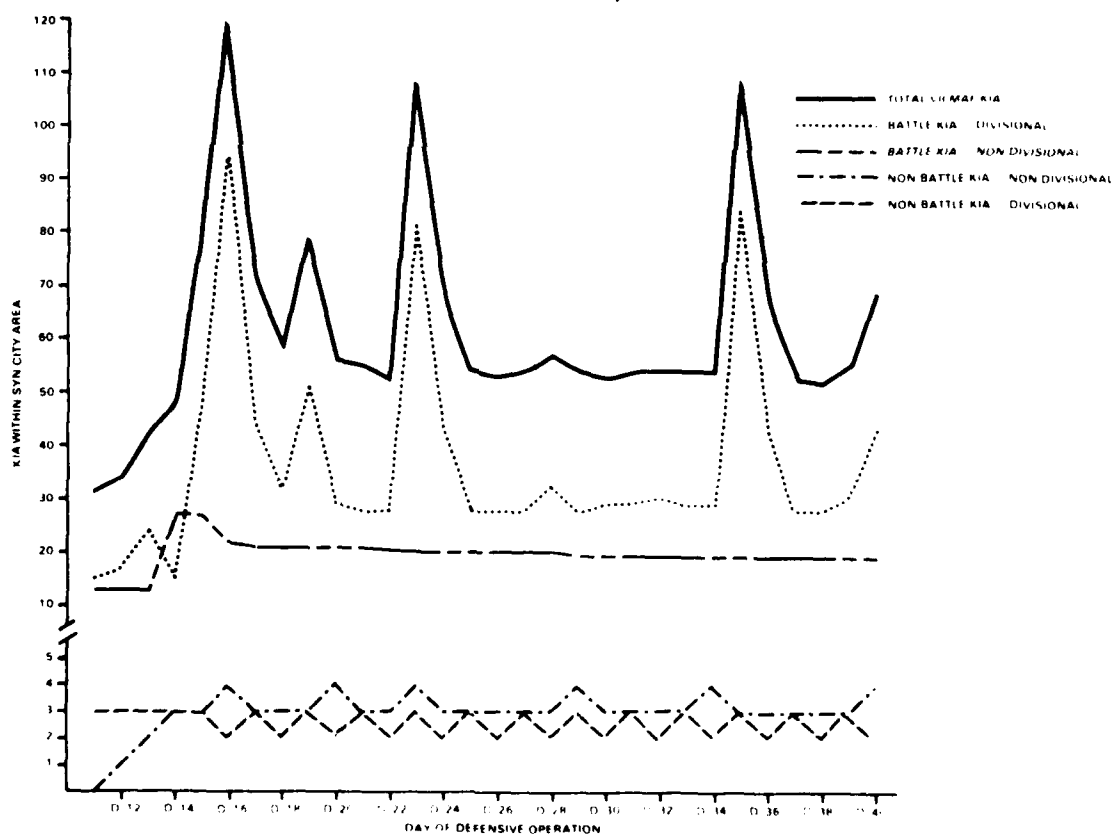


Figure V-18. KIA During SYN City Defense

# Combat Service Support Functions and Requirements

## COMBAT SERVICE SUPPORT TRAINING

NO ADDITIONAL CSS TRAINING TOPICS HAVE BEEN IDENTIFIED AS BEING PECULIAR TO AN URBAN DEFENSE BEYOND THOSE NOTED AS APPLICABLE DURING AN URBAN OFFENSE. CSS TRAINING DEFICIENCIES ARE NOT OF SUCH MAGNITUDE AS TO JEOPARDIZE THE MAF DEFENSE OF SYN CITY. DEFICIENCIES NOTED IN VOLUME I OF THIS STUDY ARE SHOWN BELOW.

Reference: Volume I, "General Urban Warfare Amphibious Logistics Applications," pp. V-184 to V-187.

UNIT	CSS TRAINING TOPIC	TRAINING METHOD				
		MOBILE TRAINING TEAM	PROF DEVELOP SEMINAR	COMMAND POST EX	MOS SCHOOL	PRACTICAL EXERCISE
SUPPLY BN. FSSG	BUILDING REQUIREMENTS FOR SUPPLY STORAGE	x	(x)			x
	CAMOUFLAGE OF SUPPLIES (URBAN EXPEDIENTS)	x				(x)
	MATERIALS HANDLING WITHIN CONFINED AREAS		(x)	x		(x)
	FORWARD SALVAGE OPERATIONS			x		(x)
MAINTENANCE BN. FSSG & OTHER 2ND ECHELON MAINTEN- ANCE ELEMENTS	UTILIZATION OF URBAN MAINTENANCE FACILITIES	x	(x)			
	FORWARD MAINTENANCE OPERATIONS (CONTACT TEAM)		(x)	x		(x)
	EQUIPMENT HARDENING IN URBAN AREAS	(x)	x			x
TRUCK CO. MARDIV MT BN. FSSG & OTHER UNITS WITH MT CAPABILITIES	VEHICULAR MANEUVERABILITY IN CONFINED AREAS	x			x	(x)
	VEHICULAR HARDENING REQUIREMENTS	(x)	x			x
	CONVOY OPERATIONS IN URBAN AREAS	x	(x)	x	x	x
ENGR SUPT BN. FSSG	SUPPORT REQUIREMENTS FOR PORT AND AIRFIELD REHABILITATION	(x)	x			
	INTERFACE WITH CIVILIAN UTILITY NETWORKS	(x)			x	x
	RAPID RUNWAY REPAIR (R <sup>3</sup> ) TECHNIQUES	(x)	x		x	(x)
ALL COMMUNICA- TIONS UNITS & ELEMENTS	COMMUNICATION TECHNIQUES IN URBAN AREAS	x	x	(x)	x	(x)
MP CO. MARDIV MP CO. FSSG	RIOT CONTROL OPERATIONS		x		x	(x)
	EVACUATION AND REFUGEE CONTROL		(x)		x	x
CIVIL AFFAIRS GROUP	ALL ASPECTS OF CA OPERATIONS IN URBAN AREAS	x	x	(x)		

x SUITABLE TRAINING METHOD  
(x) PRIMARY TRAINING METHOD(S)

Figure V-19. Urban Warfare CSS Training Deficiencies

## Combat Service Support Functions and Requirements

### LEGAL ASSISTANCE

PROLONGED COMBAT IN AN URBAN AREA WILL NECESSITATE AUGMENTATION OF MAF LEGAL RESOURCES IN THE AREAS OF MILITARY JUSTICE AND INTERNATIONAL LAW/CLAIMS. AUGMENTATION TEAMS SHOULD BE DEPLOYED AS SOON AS PRACTICABLE FOR ARRIVAL IN SYN CITY NO LATER THAN D+6.

Reference: Volume I, "General Urban Warfare Amphibious Logistics Applications", pp. V-188 to V-189.

Legal assistance requirements generated during the defense of an urban area will increase due to a potentially higher military crime rate as well as the eventual legal interaction between the defending force and the local government. Augmentation requirements for long-term operations (>15 days) have been articulated in Volume I of this study. They include additional teams to handle war crimes investigation and courts martial as well as international law/claims teams organic to the 4th CAG. The total legal augmentation is shown below.

TABLE V-23. LEGAL AUGMENTATION FOR PROLONGED URBAN OPERATIONS

<u>Team Description</u>	<u>Number</u>	<u>Strength</u>		<u>Source</u>
		<u>Off</u>	<u>Enl</u>	
War Crimes Investigation	1	2	2	FMF/DON
General Court Martial	1	6	5	FMF
Trial Personnel	1	6	6	FMF
International Law/Claims	2	1	3	4th CAG (Organic)
Total Personnel		16	19	



## Combat Service Support Functions and Requirements

### FINANCIAL MANAGEMENT

THE CSS FUNCTION OF FINANCIAL MANAGEMENT IS LARGELY UNAFFECTED BY DEFENSIVE COMBAT IN AN URBAN AREA. RELEVANT CONSIDERATIONS INCLUDE PAYMENT FOR PROPERTY SEIZED OR CONFISCATED, PAYMENT FOR CIVILIAN SUPPORT ITEMS, AND DISBURSEMENT ACTIONS TO VII MAF PERSONNEL.

General considerations regarding financial management were noted in Volume I of this study and will not be repeated herein. Standard procedures would apply to the SYN City combat situation as would apply in non-urban environment. Special considerations applicable to urban combat include financial interaction with the local government and disbursement procedures.

Potential areas of financial interaction with the local government center around reimbursement for civilian ration support and payment for any local Class IV supplies seized or confiscated by VII MAF during the course of the defensive action. If VII MAF has been tasked by higher authority to provide subsistence support to the populace, the MAF comptroller will have to coordinate the financial aspects of that support. Special funding should be provided by sources external to the Marine Corps to procure those supplies. In turn, the MAF comptroller should coordinate through the 4th CAG with the SYN City government for reimbursement for that support. Given a short notice activation and deployment, it is doubtful that sufficient quantities of selected Class IV items will be included in the mount-out to support extensive defensive preparations. These materials will be seized for VII MAF use and credit vouchers will be given to local property owners. The MAF G-4 will coordinate all aspects of this exchange and arrange for sufficient Class IV items to be embarked in resupply echelons to replace seized items.

Financial disbursements to VII MAF personnel will follow guidelines established by the MAF FAO\*. These guidelines are not significantly different from those that would be set forth in a nonurban environment. The following procedures are not all inclusive and are intended to be illustrative, subject to modification based on the actual situation.

- Military payment certificates (MPCs) will be the medium for payment of all monies and obligations within the combat zone. The use of US currency is expressly forbidden in SYN City.
- Financial processing stations will be established during the pre-deployment sequence to accommodate any desired changes to a service member's pay situation. Individuals will be encouraged to allot the bulk of their pay to family members or authorized financial institutions.
- The FAO will establish an individual limit on the amount of pay issued as MPCs. Monies not issued as MPCs or allotted to authorized recipients will be retained by the central disbursement authority and credited to the individual's account.

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\*Financial Accounting Offices

## Combat Service Support Functions and Requirements

### AUTOMATED DATA PROCESSING SYSTEMS SUPPORT

ADPS SUPPORT WILL BE ACCOMPLISHED IN AN URBAN DEFENSE IN THE SAME MANNER AS IN OTHER COMBAT OPERATIONS. UNITS WILL LOCATE THEIR DEPLOYED ADPE-FMF IN BATTALION AND DIVISION REAR AREAS.

Data processing units (DPUs) and automated data processing equipment (ADPE-FMF) organic to VII MAF units will provide continuing ADPS support as VII MAF defends SYN City. The ADPS support concept during the offensive phase of the SYN City operation contained the following measures:

- All organic ADPE-FMF and DPUs accompanied deployed units in the AE and AFOE. This equipment was phased ashore beginning on D+4 and operational by D+10.
- The Force Automated Services Center (FASC) was deployed to theater air facilities near the AOA. DCS\* entry into AUTODIN\* was provided at that location.
- Daily courier flights collected data reports, distributed system reports, and provided the link between units deployed within the FBH and DPUs at the TAB.
- Electric power was provided by the Cbt Engr Bn for divisional units, Engr Supt Bn for FSSG units, and the Wing Engr Sqdn for units of 7th MAW. (Commercial power assumed to be unavailable and/or incompatible.)

This concept of ADPS support is still viable once VII MAF assumes a defensive posture. ADPE within the FBH will be located in battalion or division rear areas within structures that offer protection from the elements. Electric power will be provided by the appropriate engineer element. Intermediate level maintenance of ADPE will be accomplished by civilian vendors at the TAB and by Navy MOTUs\* in the FBH. Courier flights will be provided on a daily basis by 7th MAW (Fwd).

Currently, the FASC organic to each MAF is not deployable without considerable effort and priority. This situation will complicate ADPS support until such time as deployable FASCs are fielded. It is anticipated that deployable FASCs will be fielded by mid-1983. The system will require two C-141 lifts and electrical support from a 100 kw generator.

The only impact of an urban area on ADPS support is the potential availability of buildings to house the ADPE and operating personnel. ADPS support will be accomplished in the same manner as in other operational environments.

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\*Defense Communications System, Automatic Digital Network, Mobile Technical Unit

## Combat Service Support Functions and Requirements

### DENTAL SERVICE

DENTAL SERVICE FOR VII MAF WILL BE PROVIDED BY DECENTRALIZED COMPANIES AND DETACHMENTS CO-LOCATED WITH MEDICAL COMPANIES AT INTERMEDIATE SUPPORT POINTS AND CSSAs. THE CURRENT DENTAL CAPABILITY IS JUDGED INSUFFICIENT TO HANDLE PEAK MAF WORKLOADS AND MARGINAL FOR AVERAGE WORKLOADS. CONFLICT IN URBAN AREAS WILL LIKELY INCREASE THE DENTAL WORKLOAD.

Navy and Marine Corps doctrinal publications cite the following field dental support missions: general dentistry support, care of maxillofacial injuries, assistance with the initial treatment of casualties, general medical assistance during mass casualty situations. During the SYN City offensive, dental services and resources were concentrated on the treatment of maxillofacial injuries (MFI) and the assistance provided in the care of non-MFI casualties. Dental support was ship-based at the onset of the offensive and progressively established ashore by D+10 with the landing and deployment of the AFOE.

The preferred concept for dental support during the SYN City defense is to establish decentralized dental clinics co-located with Medical Bn Medical Cos. Dental clinics will be established at the following locations:

	<u>LOCATION</u>	<u>DENTAL RESOURCES</u>	<u>UNIT SUPPORTED</u>
Dental Clinic 1	CSSA 1	Company	MAF Cmd Elem, FSSG (-)
2	CSSA 2	Company	FSSG (-)
3	ISP 1	Detachment	10th Marines (+)
4	ISP 2	Detachment	1st Marines (+)
5	ISP 3	Detachment	2nd Marines (+)
6	ISP 4	Detachment	3rd Marines (+)

Additional dental resources may be available aboard amphibious shipping; workload estimates in subsequent paragraphs do not include these resources.

Historical evidence from recent conflicts has shown that general dentistry support levels were approximately one general dentist in support of one thousand combat personnel. Assuming that this support relationship remains fairly constant for the near term and mid-range periods (increases in services potentially balanced by increased dental productivities), a total of 59 general dentists would be required to support VII MAF including earmarked replacements and VII MAW (Rear). Once VII MAF has established its defensive posture within the city and selected elements have been redeployed to other locations, the number of general dentists required in SYN City drops to 44 while the requirement at other locations remains at 13 general dentists. The current authorization of 17 general dentists in each of four Dental Companies in the Dental Battalion appears to be adequate in aggregate terms to accomplish the general dentistry workload.

The incidence of maxillofacial injuries (MFI) among WIA during the Korean and Vietnamese Conflicts has been in the range of 10-15%. The exact percentage increase is difficult to estimate as dental workloads have not been well-documented in urban-only situations. If 15% of all WIA+DNBI admissions require maxillofacial treatment, then the MFI workload ranges from 98 peak cases per day to 38 "steady-state" cases per day. This oral surgery workload far exceeds the capability, provided by one oral surgeon per Dental Company, at the peak level and would exceed the surgical capability at the "steady-state" level if one or more of the oral surgeons were incapacitated. This deficiency in oral surgery capability is not an urban-unique problem and could be remedied by the provision of additional surgeons (and oral surgery ADALs) during combat deployments.

The tasking of dental units to assist with the initial treatment and subsequent care of casualty admissions will be facilitated by the decentralized posture of dental assets as well as the co-location of these assets with Medical Companies. Dental officers and support personnel will assist with the triage process, emergency resuscitation, surgical preparation, and casualty evacuation. Training in these subject areas is provided on a periodic basis for all FMF dental units. The medical assistance provided by dental personnel will serve to increase the medical capability under surge conditions and reduce reliance upon external medical support.

Mass casualty situations will quickly overwhelm the organic VII MAF medical capability. The most effective way of dealing with such a situation is to classify the casualties according to severity of injury and expectancy of survival. Properly trained dental professionals would augment medical triage teams and other paramedical elements to classify the wounded and then administer such treatment as deemed appropriate by the medical staff.

The dental concepts and deficiencies presented in this section are not unique to the urban situation. The urban environment does provide covered areas within structures for the administration of dental services. The use of these areas would promote more sanitary working conditions and reduce requirements for tentage and camouflage materials. With respect to the deficiencies noted in the overall dental support system, the following recommendations are submitted:

- Additional efforts should be directed towards quantifying the MFI workload and oral surgeon productivity on the NBC battlefield.
- Additional oral surgery teams should be identified and embarked in such quantities to satisfy the redefined MFI workload.
- Medical augmentation training programs should be recurring and mandatory for all FMF dental personnel.

## Combat Service Support Functions and Requirements

### FOOD SERVICE

FOOD SERVICES WILL BE CENTRALIZED AT BATTALION REAR AREAS AND RATIONS WILL BE SENT FORWARD TO COMPANY-SIZED ELEMENTS BY INSULATED CONTAINER. FEEDING SCHEDULES WILL BE STAGGERED SO THAT NO MORE THAN 25% OF THE PERSONNEL ARE MESSING AT ANY ONE TIME.

The concept for providing food service to VII MAF during the SYN City defense does not differ markedly from normal food service concepts and practices. The urban area does provide covered facilities for ration stockage, preparation, and messing. Refrigeration requirements from D+11 through D+40 will be minimal due to the feeding of B vice A rations. The normal allowance of refrigeration equipment should be adequate in this situation.

The ration mix throughout the D+11 through D+40 period will be as set forth in MCO P4400.39D, War Reserve Policy. This mix is shown for ground combat troops and aviation/support troops in the table below. No A rations will be prepared within the AOA during the defensive period. The ration mix for 7th MAW (Rear) is dependent upon the location and facilities available at the theater air base. Food service policies and procedures for these personnel will be in accordance with the installation SOP.

The food service concept remains constant in each of the missions to defend inside the city. Battalion mess sections will establish field kitchens in suitable structures within the battalion rear area. The structures selected should be of nonflammable construction and possess good internal ventilation, or the means to accept expedient ventilation equipment. During periods of low combat intensity, subordinate elements within the battalion area will rotate their personnel back to the messing facility. Battalion elements not within the battalion area can make prior arrangements to mess with another unit or have rations transported to their location via insulated container. As the combat intensity increases, forward units will be serviced almost exclusively by insulated containers brought forward to their locations, while service support and aviation units not in direct contact or under fire retain both messing options.

Planning factors for Class I items will be addressed in Chapter VII--Logistic Planning Factors and Usage Rates.

TABLE V-24. RATION TYPE AND MEAL COUNT DURING DEFENSIVE PHASE

	Ground Combat Troops	Aviation & Support Troops
D+11 to D+30	20C/40B	6C/54B
D+31 to D+40	4C/26B	3C/27B

## Combat Service Support Functions and Requirements

### SPECIAL SERVICE CLUBS

THE COMBAT REQUIREMENTS DURING THE PREPARATION FOR AND CONDUCT OF A DELIBERATE DEFENSE OF SYN CITY PRECLUDE THE ESTABLISHMENT OF SPECIAL SERVICE CLUBS ASHORE. ACTIVITIES OF THIS NATURE WILL BE AVAILABLE IN A LIMITED FORMAT AT HOSPITALS, CONVALESCENT CENTERS, AND ABOARD AMPHIBIOUS SHIPPING REMAINING WITHIN THE AOA.

Reference: Volume I, "General Urban Warfare Amphibious Logistics Applications", pp. V-200.

### EXCHANGE SERVICES

EXCHANGE SERVICES PER SE WILL NOT BE PROVIDED UNTIL THE SYN CITY SITUATION STABILIZES. A RATION SUPPLEMENT SUNDRIES ASSORTMENT WILL BE ISSUED IN CONJUNCTION WITH THE BASIC COMBAT RATION. AAFES SUPPORT WILL BE REQUESTED ON D+11.

Reference: Volume I, "General Urban Warfare Amphibious Logistics Applications", pp. V-199, VII-48 to VII-49.

### POSTAL, ADMINISTRATION, AND BAND

URBAN OPERATIONS DO NOT ALTER THESE CSS FUNCTIONS IN ANY APPRECIABLE SENSE. PERSONNEL PERFORMING THESE FUNCTIONS WILL REQUIRE THE SAME BASIC INDOCTRINATION AND TRAINING AS IS PROVIDED TO ALL OTHER VII MAF PERSONNEL. URBAN NAVIGATION AND MAP READING SUBJECTS SHOULD BE STRESSED.

Reference: Volume I, "General Urban Warfare Amphibious Logistics Applications", pp. V-198.

## Combat Service Support Functions and Requirements

### ECCLESIASTICAL SERVICES

ECCLESIASTICAL SERVICES PROVIDING MORAL, SPIRITUAL, AND RELIGIOUS GUIDANCE TO PERSONNEL OF VII MAF SHOULD BE CONDUCTED IN A MANNER COMMENSURATE WITH THE INCREASED LEVEL OF VULNERABILITY FROM THE THREAT INTERNAL AND EXTERNAL TO SYN CITY.

The information and considerations provided in Volume 1 of this study remain valid. Although ethnological information is not provided in the data base, this type of information would be known as soon as the location of SYN City was fixed and subject to verification once the assault phase of the operation had been completed. The presence of 53 churches in SYN City, noted in the data base, suggests that religious influences are important and that unit commanders should stress the avoidance of these structures and artifacts whenever possible.

Those functions which chaplains normally perform in the theater of operations will be the same in an urban environment. However, the presence of a densely populated urban environment in Aggressor territory requires that the VII MAF chaplain and staff interface with their SYN City counterparts to promote mutual understanding, provide civil information, and establish guidelines under which a situation of religious normalcy would accrue to the advantage of VII MAF. The MAF requirement for internal security within SYN City, especially during a defensive posture requires that SYN City religious officials administer to the welfare of the population by informal visitation vice organized church services involving the movement and congregation of thousands of civilians. These actions are necessary to protect the populace against inordinate exposure to casualty-producing situations and reduce the potential for partisan organizing activities.

The threat from partisan groups within SYN City and Aggressor forces outside the city is such that congregations of VII MAF personnel should be avoided whenever possible. Accordingly, unit chaplains will conduct their activities on an informal basis in groups generally not larger than fire team to platoon size. Organized church services involving entire units or sections should be avoided and all such activities should be conducted under cover. These considerations are not abnormal in a combat situation, but they become increasingly important in urban warfare especially when in Aggressor territory.

CHAPTER VI  
INDIGENOUS RESOURCES



## Indigenous Resources

### INTRODUCTION

SYN CITY HAS THE POTENTIAL FOR PROVIDING MANY RESOURCES THAT WOULD ENHANCE THE DEFENSIVE EFFORTS OF VII MAF. NATURAL RESOURCES, SUCH AS LAND AND WATER, ARE VITAL TO THE ACCOMPLISHMENT OF ANY COMBAT MISSION.

VII MAF cannot accomplish its mission in SYN City without utilizing selected resources available within the city. Categories of resources of interest to VII MAF include natural resources, facilities, structures, utilities and communications, LOCs, equipment, supplies, and human resources. Each of these categories was discussed in Volume I, Chapter VI as to the general MAF requirement for the resource and possible Aggressor denial actions preceding and during the assault landing. All resource categories noted above were utilized by the Landing Force during offensive operations. The figure opposite shows both military and civil requirements for each resource.

Resource management in an urban area is substantially more complicated than that in an open environment. The management responsibility is vested in CG VII MAF although subordinate commanders will ultimately exercise this management responsibility with coordination and advice provided by the 4th CAG. Unit commanders are responsible for exercising proper management of public and private property converted to their use.

VII MAF will continue to utilize selected indigenous resources to further its defensive operations. Most of the resources noted as being essential or desired for MAF use during the offensive phase will be used for the same purposes when VII MAF adopts a defensive posture within the city. Exceptions include farmland and industrial areas which lie outside the FEBA (Missions 6 through 10), the bulk fuel complex which was totally destroyed and not within the MAF capability to rehabilitate, utility systems which are not functional, and LOCs which are untenable or are not useful to the defensive effort.

The focus of the remainder of this chapter will be the prioritized use and management of land areas which lie inside the SYN City metropolitan boundary. Multiple requirements for other indigenous resources are not expected to pose significant conflicts that cannot be resolved by subordinate commanders. Land areas will be at a premium in certain sections of the city once VII MAF defenses are wholly contained within the FEBA.

RESOURCE	RESOURCE UTILIZATION													MANAGEMENT BY VII MAJ	
	MILITARY REQUIREMENT								CIVIL REQMT						
	MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL COMMUNICATIONS	SUPPLY	MAINTENANCE	PUBLIC SAFETY	PUBLIC HEALTH	PUBLIC INFORMATION	NO IDENTIFIED REQMT	CA MANAGEMENT	GCE MANAGEMENT	ACE MANAGEMENT	CSSE MANAGEMENT
NATURAL	1.2 4.6 8	3.6 7.8	3	3.6 8		2.3 4.8	4	6.8	1.5 6.8			1	2.3 6.7		4
FACILITIES	3.6			5		1.3	4.5	2						6	1.2 3.4 5
STRUCTURES			**		1.3 5.6	1.4	1	2.3	4.7	3	8	ALL			
UTILITIES AND COMMUNICATIONS				1.2 3.4	5.6 7.8			1.5	1.2 3.4	7.8		ALL			
LOCs	ALL														1.2 3
EQUIPMENT	2.4	4	5	4		1.2	3	5	2			5		3	1.2 4
SUPPLIES	1.3	1	1	1		1.3			2.4			2.4			1.3
HUMAN				2	1.3			3.4	2	1.5		ALL			

SPECIFIC  
UTILIZATION  
IN VOL

SPECIFIC EXAMPLES OF  
UTILIZATION PROVIDED  
IN VOLUME I CHAPTER VI

\*GENERAL MANAGEMENT RESPONSIBILITY NOTED SHOULD BE REEVALUATED ON A CASE BY CASE  
BASIS ONCE ASSAULT UNITS HAVE LANDED

\*\*AS REQUIRED, STRUCTURE TYPES WILL VARY

NATURAL	1. Farms 2. Fields 3. Woods 4. Surfaced Areas 5. Interment sites 6. Lakes (Ponds) 7. Swamps 8. Rivers	EQUIPMENT	1. MHE 2. Motor Transport 3. GSE (Aviation) 4. Engineer 5. Public Safety	STRUCTURES	1. Warehouse 2. School 3. Police & Fire Station 4. Stores/Shopping Centers 5. Private Dwellings 6. Hotels/Apartments 7. Medical 8. Churches & Museums
FACILITIES	1. Port 2. Prison 3. Bulk Fuel Complex 4. Naval Station 5. Industrial Areas 6. Airfields	SUPPLIES	1. Construction 2. Subsistence 3. Fuel 4. Medical	UTILITIES & COMMUNICATIONS	1. Water Treatment 2. Electric Power 3. Waste Treatment 4. Sanitary Disposal 5. Police & Fire Comm. 6. Telephone 7. Radio & Television 8. Newspapers
LOCs	1. Roads 2. Bridges 3. Railroads	HUMAN	1. Civil Government 2. Utility 3. Public Safety 4. Equipment Operator 5. General Population		

Figure VI-1. VII MAF Utilization of Indigenous Resources

## Indigenous Resources

### RESOURCE MANAGEMENT

THE OCCUPATION OF URBAN AREAS DURING DEFENSIVE OPERATIONS MAY REQUIRE THE PRIORITIZED ASSIGNMENT OF INDIGENOUS RESOURCES FOR COMBAT, COMBAT SUPPORT, AND COMBAT SERVICE SUPPORT PURPOSES.

This section is intended to give general resource management guidance applicable to defensive operations wholly or partially contained within an urban area. More definitive guidance is possible only when the actual infrastructure of the urban area is known. Volume I Chapter VI of this study effort addressed the various categories of indigenous resources that would be utilized by VII MAF and the Landing Force. This section will elaborate on assignment priorities as when a single resource is required for multiple purposes. Resources whose utilization is clear-cut will be mentioned briefly in order to provide a more complete guidance package.

Areas of particular interest to VII MAF during the SYN City defense include the Forward Defense Area and areas utilized for combat service support activities. Although VII MAF has consolidated all SYN City areas within the metropolitan boundary, most subordinate units will be located and conducting defensive operations within these two areas. Prioritized resource utilization in other areas is not anticipated to present insurmountable problems to defensive planners. It should be noted that all civilians will be evacuated from the Forward Defense Area, CSSAs 1 and 2, and ISPs. All commercial enterprises will be closed down except for those providing for the direct welfare and subsistence of the populace. These measures are necessary to minimize civilian interference with military operations and allow civilians to effect self-protection against eventual combat actions occurring in sections of the city not used directly for military purposes.

The two categories of indigenous resources that will be the hardest to manage and allocate are land areas between the structures and the structures themselves. The SYN City Data Base does not provide any detailed information concerning building density or open land with areas less than .01 sq km. Such information would be readily available from aerial photography. The following subsections will provide general assignment priorities in the event that a single land area or building is desired for multiple purposes. Nonconflicting requirements will be accommodated on a first-come first-served basis.

THE BDM CORPORATION

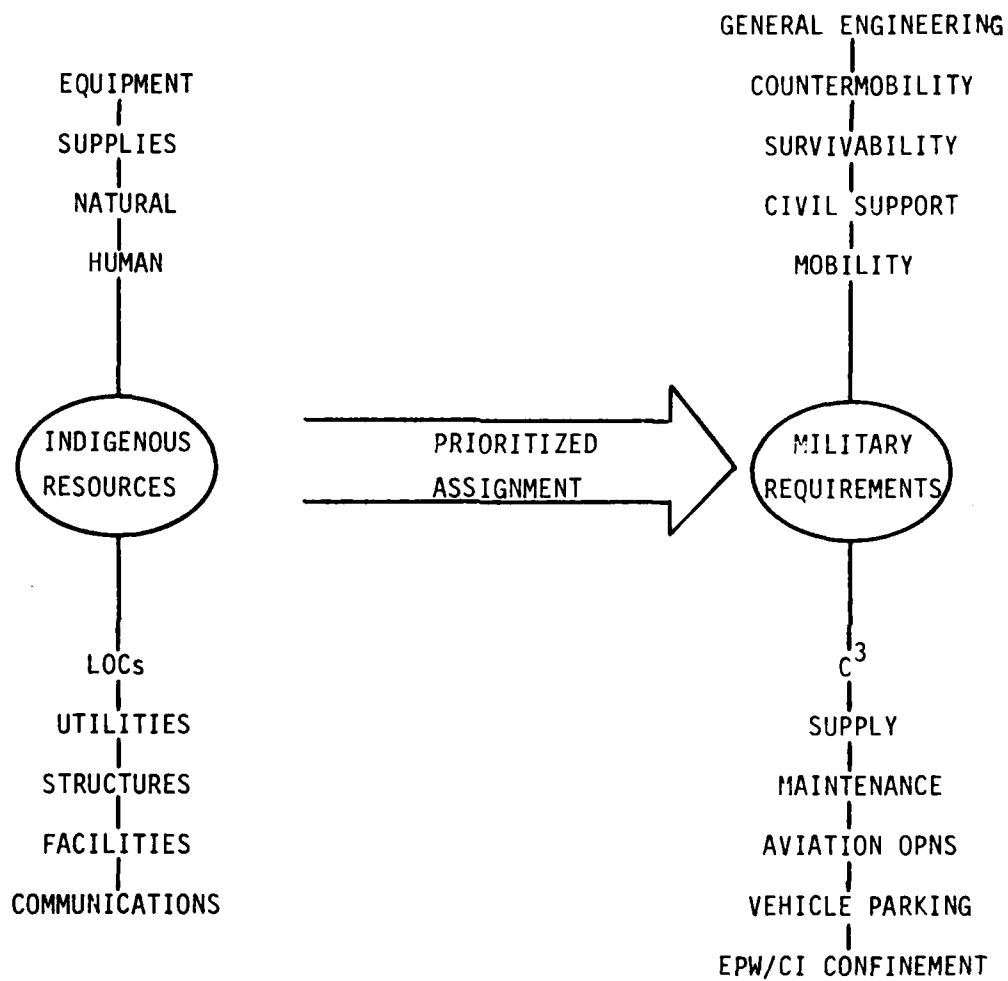


Figure VI-2. Indigenous Resources vs Military Requirements

## Indigenous Resources

### Resource Management (Continued)

#### Forward Defense Area

The majority of VII MAF combat and combat support units will be deployed in the Forward Defense Area (FDA). This area will also be used for extensive countermobility operations involving the installation of barriers and obstacles in proximity to the FEBA. A limited amount of supplies will be stored on position and organizational maintenance will be accomplished in suitable areas provided for that purpose. Most major facilities in SYN City are not located in the FDA; industrial areas and airfields that are located in or near the FDA are extremely vulnerable and will not be used extensively for CSS purposes once Aggressor forces close on the FEBA.

The utilization of land and structures within the FDA is not homogeneous. The most forward slice of this area will be used for obstacles and primary strongpoint positions covering those obstacles with direct fire weapons. Very little combat support or combat service support will be accomplished in this slice. Rearward of the area containing initial obstacles and primary strongpoints will be land and structures required for a mix of combat, combat support, and combat service support functions with assignment priorities generally as listed. Many land areas and structures can be utilized for multiple purposes, i.e., on-position supplies stocked next to defensive strongpoints. At the rear of the FDA a greater variety of CSS is accomplished and resource allocation would tend to stress the satisfaction of accompanying CSS resource requirements on a comparable priority with combat and combat support requirements. In most cases within the FDA, land areas and structures will be allocated for countermobility/survivability, supply/maintenance, and other activities in that order. C3 requirements are many times coincidental with those for strongpoint positions (survivability).

The utilization of other indigenous resources located in the FDA should present no problems to tactical or service support element commanders. Utilities, if available, will be used to the maximum extent possible to supplement utility equipment organic to the MAF. Indigenous communications equipment will be used to coordinate civil support and issue essential information to the populace. Indigenous MT, MHE, and public safety equipment will be evacuated to other areas in SYN City to provide subsistence and health and welfare support to the populace. Engineer equipment found in the FDA will be used to supplement that organic to the MAF during the initial development of inner-city barriers and strongpoint positions. Construction supplies (lumber, sand, gravel, fencing) will be used almost exclusively for countermobility and survivability purposes.

RESOURCE CATEGORY TYPE		RESOURCE UTILIZATION PRIORITY AS APPLIED TO MILITARY REQUIREMENT									
		MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL AND COMMUNICATIONS	SUPPLY	MAINTENANCE	AVIATION OPERATIONS	VEHICLE PARKING	POW-CI CONFINEMENT
LAND	OPEN	2	1	2	-	-	3	3	1	4	-
	VEGETATED	2	1	2	-	-	3	3	-	4	-
	HARD SURFACE	2	1	2	-	-	3	3	1	4	-
WATER	RIVERS	3	1		2						
	STREAMS				1						
FACILITIES	PORT DOCKS	THESE FACILITIES ARE NOT LOCATED IN THE FORWARD DEFENSE AREAS WITHIN SYN CITY									
	PRISON										
	BULK FUEL COMPLEX										
	NAVAL STATION										
	INDUSTRIAL AREAS		1	2	3						
STRUCTURES	AIRFIELDS	1	2						1		
	SHOPPING CENTERS	-	-	-	-	2	1	-	-	-	-
	SCHOOLS	-	-	-	-	-	-	-	-	-	-
	MUNICIPAL	-	-	1	-	1	2	-	-	-	3
	PRIVATE DWELLINGS	-	2	-	-	1	-	-	-	-	-
	HOTELS APARTMENTS	-	-	2	-	1	-	-	-	-	-
UTILITIES	MEDICAL	-	-	1	-	-	-	-	-	-	-
	ALL	-	-	1							
COMMUNICATIONS ALL					1						
LOCs	ROADS					3	3	2	4		
	BRIDGES		2								
	RAILROADS					1					
EQUIPMENT	MHE. MT	EVACUATED TO CSS AND OTHER AREAS									
	ENGINEER										
	PUBLIC SAFETY	EVACUATED FROM FORWARD DEFENSE AREA									
SUPPLIES	CONSTRUCTION		1	1	2						
	OTHER		-								
HUMAN	ALL	ALL INDIGENE EVACUATED									

Figure VI-3. Indigenous Resource Utilization Priorities in Forward Defense Area

## Indigenous Resources

### Resource Management (Continued)

#### Combat Service Support Areas

Combat service support areas within SYN City include CSSAs 1 and 2 and Intermediate Support Points (ISPs) 1 through 4. Most combat service support for units deployed in the FDA originates in one or more of these CSS areas. A full range of CSS is provided at the CSSAs while a more austere level is provided at forward-located ISPs. Civilians will be evacuated from all CSS areas to other locations within the city.

While the resource utilization emphasis in the FDA focused on the establishment and continued support of countermobility and survivability operations, the emphasis in CSS areas centers on utilizing available indigenous resources to enhance or complement combat service support efforts. Requirements at these CSS areas for extensive barriers or strongpoint positions are generally not as extensive as in the FDA; available land areas and structures are in greater demand for supply storage, maintenance operations, and POW/CI confinement. Not all land and structures in the CSS areas can be converted totally for military use; some of these resources will be required to provide subsistence or welfare support to the populace. In fact, many of the indigenous resources located in CSS areas will provide civil support once higher priority military requirements have been satisfied.

The SYN City Data Base provides some information concerning building types and land use patterns in areas that have been established by VII MAF for CSS activities. It is reasonable to assume that many buildings within the main port area (CSSA 1) can be used for supply storage as well as higher echelon maintenance operations provided that the level of damage suffered during offensive operations is not severe. CSS activities within CSSAs and ISPs should be dispersed as much as possible to provide a greater degree of protection against indirect fires and air attacks. Land area requirements for supply storage decrease significantly once Class V stocks are stored in a modular configuration, but a greater dispersion of these stocks is expected to require the same overall land area as during offensive operations.

The most crucial resource utilization decisions in CSS areas will involve warehouses and other similar structures with large interior spaces. These structures should be earmarked for supply storage, maintenance, and additional POW/CI confinement in that order. Indigenous stocks stored in these structures should be relocated or drawn down to provide room for VII MAF CSS activities. As in all other areas within the city, large open land areas will be used for aviation operations (V/STOL facilities) when the areas are appropriately located.

RESOURCE CATEGORY TYPE		RESOURCE UTILIZATION PRIORITY AS APPLIED TO MILITARY REQUIREMENT									
		MOBILITY	COUNTERMOBILITY	SURVIVABILITY	GENERAL ENGINEERING	CMD CONTROL AND COMMUNICATIONS	SUPPLY	MAINTENANCE	AVIATION OPERATIONS	VEHICLE PARKING	POW/CI COMPONENT
LAND	OPEN	4	4	-	-	2	3	1	3	-	-
	VEGETATED	-	2	-	-	-	1	-	1	-	-
	HARD SURFACE	4	3	-	-	2	1	1	3	-	-
WATER	RIVERS	3	1	2	-	-	-	-	-	-	4
	STREAMS	-	-	1	-	-	-	-	-	-	2
FACILITIES	PORT DOCKS	-	-	-	-	1	2	-	-	-	3
	PRISON	-	-	-	-	-	-	-	-	1	1
	BULK FUEL COMPLEX	3	-	-	-	1	-	-	-	-	2
	NAVAL STATION	THESE FACILITIES ARE NOT LOCATED IN DESIGNATED CSS AREAS WITHIN SYN CITY									
	INDUSTRIAL AREAS										
	AIRFIELDS										
STRUCTURES	SHOPPING CENTERS	-	-	-	-	1	2	-	-	3	4
	SCHOOLS	-	-	-	-	-	-	-	-	-	-
	MUNICIPAL	-	-	-	1	2	3	-	-	-	-
	PRIVATE DWELLINGS	-	-	-	1	-	-	-	-	-	-
	HOTELS APARTMENTS	-	-	3	1	2	-	-	-	-	-
	MEDICAL	-	-	1	-	-	-	-	-	-	2
UTILITIES	ALL	-	-	1	-	-	-	-	-	-	2
COMMUNICATIONS	ALL	-	-	-	1	-	-	-	-	-	2
LOCs	ROADS	1	-	-	-	4	3	2	5	-	-
	BRIDGES	1	2	-	-	-	-	-	-	-	-
	RAILROADS	-	-	-	-	1	-	-	-	-	-
EQUIPMENT	MHE MT	-	-	-	1	-	-	-	-	-	2
	ENGINEER	-	1	2	-	3	-	-	-	-	4
	PUBLIC SAFETY	-	-	-	1	-	-	-	-	-	2
SUPPLIES	CONSTRUCTION	-	1	1	2	-	-	-	-	-	3
	OTHER	-	-	-	-	-	-	-	-	-	1
HUMAN ALL		ALL INDIGENE EVACUATED									

Figure VI-4. Indigenous Resource Utilization Priorities  
in CSS Areas



CHAPTER VII  
LOGISTIC PLANNING FACTORS AND USAGE RATES

## Logistic Planning Factors and Usage Rates

### INTRODUCTION

DEFENSIVE COMBAT IN URBAN AREAS NECESSITATES MODIFICATIONS TO SUPPLY PLANNING PROCEDURES AS WELL AS OPERATIONAL TACTICS. THE ULTIMATE SUCCESS OF VII MAF ELEMENTS COMMITTED WITHIN THE SYN CITY METRO AREA WILL BE SIGNIFICANTLY AFFECTED IF CRITICAL MATERIALS HAVE NOT BEEN IDENTIFIED, PROCURED, AND LANDED IN SYN CITY PRIOR TO D+11.

This chapter is intended to provide estimates for usage rates for all classes of supply for VII MAF elements committed to defensive operations in the SYN City scenario. These logistic planning factors and usage rates are only preliminary planning factors and must be modified based on actual usage once defensive operations are underway. General influences of logistic planning factors include, but are not limited to:

- Mission of Threat and friendly forces.
- Area of operational commitment.
- Combat intensity and duration.
- Force structure of opposing units.
- Rules of engagement and weapons effectiveness.
- Availability of captured or indigenous materiel.

Given the SYN City environment and the concept of operation that has evolved for VII MAF to accomplish its mission, there occur some specific influences on supply planning that deserve mention.

- Defensive Missions 6 through 10 involve the use of MCATFs conducting aggressive delaying actions in the MAF Security Zone. MCATF operations are expected to occur between D+11 and D+16 whereupon the MCATFs will withdraw inside the FEBA. (The optimum enemy capability would place him on the FEBA on D+13 or D+14.)
- The composition of 7th MAW (Fwd) will change with the arrival of FIE #1 and the subsequent redeployment of selected assets once the airfields become untenable, possibly about D+16.
- Movement corridors into and within SYN City are restrictive both to the attacker and the defender.
- SYN City has an established port, LOCs, storage facilities, and essential utilities.
- Supply planning for Mission 11 (Defense Outside the City) should utilize conventional planning factors vice urban-unique factors.

## Logistic Planning Factors and Usage Rates

### CLASS I - SUBSISTENCE

THE OVERALL CLASS I PLANNING FACTOR DURING A 30-DAY DEFENSE (PERIODS VI AND VII) IS 4.69 LB/MAN/DAY AND IS DERIVED FROM SPECIFIC PERSONNEL STRENGTHS AND DIFFERING RATION MIXES DURING EACH PERIOD.

The planning factor for Class I items is heavily influenced by the mixture of ration types during the operation, the percentage of personnel consuming each ration mix, and the physical characteristics of the ration components. General guidance concerning ration mixes is given by MCO P4400.39D which delineates the ration mix for ground troops and support/aviation troops. The table below provides the ration mix and applicable personnel strengths during the anticipated 30-day defensive period beginning on D+11. These personnel strengths do not include those individuals remaining aboard assault shipping or deployed at theater facilities.

The overall Class I planning factor is valid for only those personnel in the FBH during Periods VI and VII. It should not be applied to other USMC groupments in other tactical situations or scenarios. The planning factor for personnel aboard ship or at theater facilities will be approximately equal to 6.54 lb/man/day, which is the total weight of an "A" ration.

TABLE VII-1. SUBSISTENCE PLANNING DATA - MISSION 6

PERIOD	PERSONNEL (GROUND COMBAT) <sup>1</sup>	PERSONNEL (SUPPORT) <sup>2</sup>	PERSONNEL (TOTAL)	RATION MIX (GROUND COMBAT)	RATION MIX (SUPPORT)
VI (D+11 to D+15)	21,084	24,135	45,219	5C, 10B	2C, 13B
VII (D+16 to D+30)	}20,022	}17,397	}37,419	15C, 30B	4C, 41B
VII (D+31 to D+40)				4C, 26B	3C, 27B

Note 1 - Includes MAF Cmd Elem, 7th MarDiv

2 - Includes 7th FSSG, 7th MAW (Fwd)

PERIOD	LB/MAN/DAY	CF/MAN/DAY
VI (D+11 to D+15)	4.80	.306
VII (D+16 to D+30)	4.78	.304
VII (D+31 to D+40)	4.51	.296
OVERALL	4.69	.302

## Logistic Planning Factors and Usage Rates

### CLASS II - SECONDARY EQUIPMENT ITEMS

UTILIZATION PATTERNS OF MANY CLASS II ITEMS ARE EXPECTED TO CHANGE DURING PROLONGED DEFENSIVE COMBAT IN AN URBAN AREA. ASSOCIATED REPLACEMENT FACTORS AND REPLENISHMENT QUANTITIES SHOULD BE MODIFIED ACCORDINGLY.

The corresponding section in Volume I, pp. VII-6 through VII-8, outlined some of the general considerations regarding the use of Class II items in an urban environment. This general discussion remains applicable in an urban defense situation.

Urban Combat Active Replacement Factors (CARFs) for the defensive phase of the operation were derived by a group of technical analysts familiar with the SYN City Data Base, Marine Corps equipment, and defensive combat operations in an urban environment. Over half of the group totaling six had direct combat experience during conflicts in WWII, Korea, or Vietnam. The group was tasked to estimate Class II replacement factors for selected items and was given the current TAM\*CARF and SRI Combat Active Attrition Rate (CAAR) when available. Individual questionnaires were completed and summary results were communicated to respondents during each of several rounds of this iterative Delphi process. The resulting values are presented in the right-hand columns of the table opposite.

A comparison of the replacement factors presented reveals significant disparities between USMC CARFs currently found in NAVMC 1017 and Urban Defense CARFs. Items with a greater urban applicability and usage will require replacement in proportion to that usage. HIGH-USAGE items during the SYN City defense are expected to include:

- |                                 |                           |
|---------------------------------|---------------------------|
| • Body armor                    | • Chemical detection kits |
| • WD-1/TT, coax                 | • Flashlights             |
| • Gasoline, water cans          | • M203, M60, M2, M16A1    |
| • Chemical protective ensembles | • Night vision sights     |
| • Demolition equipment          | • Manila rope             |

Items with a lower-than-normal usage during an urban defense are expected to include tentage, camouflage screen systems and inflatable boats.

The consolidated Class II planning factor, as presented in the JSCP in terms of lbs/man/day, is derived from a summation of individual item CARFs applied to the authorized item densities. The determination of a revised Class II planning factor uniquely applicable to SYN City defense would require the revision of all Class II CARFs and their application to VII MAF equipment densities. An effort of this magnitude is premature until the urban defensive CARFs contained herein are fully staffed within HQ USMC. However, analysts subjectively estimated the effects of urban defensive

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\*NAVMC 1017 - Table of Authorized Material

combat on each of the subclasses composing Class II. These estimates are given below for those VII MAF elements within the FBH.

Class II (A) - 15% Decrease (F) - 10% Decrease  
 (B) - 5% Increase (M) - 25% Increase  
 (E) - 15% Increase (T) - 15% Increase

It is recommended that the planning factors for items shown below be considered when configuring Class II support for units engaged in an urban defense; planning factors for other Class II items should be sufficient within the urban defensive context. It is also recommended that the Urban PWRM\* Special Stock include additional items designated as high-usage items in an urban environment.

\*Prepositioned War Reserve Materiel

TABLE VII-2. URBAN CARFs FOR SELECTED CLASS II ITEMS - DEFENSE

NOMENCLATURE	CLASS II SUBCLASS	TAM CARF <sup>1</sup>		URBAN CARF DEFENSE	
		EI	EN	MEAN	STD. DEV.
Armor, body	K4004	E	NL	.150	.0114
Bayonet, M7	E0050	E	.0800	.0400	.060
Block & tackle set	B0090	T	NL	.125	.0141
Cable, tale, MB-1771	K2100	B	.1700	.0850	.450
Camouflage net	K261	F	.3321	.1660	.150
Cas. support system	K4760	F	.3321	.1660	.150
Cas. gasoline, 5G	K4126	E	.3700	.1850	.045
Cas. water, 5G	V4455	E	.2000	.1000	.250
Clothing, outfit, chem, 1 adult	E2035	F	.0560	.0280	1.50
Clothing, outfit, chem, ensmb1	E2130	F	4.464	.442	2.50
Decum kit, M13	E2700	E	NL	NL	.275
Demo equip, engine, 1/2	E1080	E	.0600	.0300	.280
Demo equip, indiv	E1290	E	NL	NL	.280
Detector kit, M256	E2101	E	.0650	.0300	.500
Dispenser, RCA, port, M1	E0320	E	NL	NL	.182
Flashlight, plastic	K4352	E	NL	NL	1.000
Generator, smoke, M3A3	E0523	E	NL	NL	.040
Htr, space, 60000 BTU, M1950	V4550	E	.000	.0400	.060
Individual clothing, ensemble	Various	F	NL	NL	.700
Individ clothing, ensemble, cold	Various	F	NL	NL	.450
Landing boat, inflat, 7-man	E5170	E	.1600	.0800	.055
Launcher, grenade, M203	E0892	M	.1400	.0700	.220
MG, 7.62mm, M60	E0990	M	.2350	.1170	.550
MG, cal .50, M2	E0980	M	.0600	.0300	.260
Minefield marking set	R1320	E	NL	NL	.080
Night vision sight, individ	E1158	B	.1842	.0920	.430
Rifle, 5.56mm, M16A1	E1440	M	.2293	.1145	.260
Rope, manila, 3/4"	J3215	E	NL	NL	1.000
Shop sets & equipment, various	E1644	B,E	NL	NL	.180
	thru				
	E1720				
Shotgun, 12 ga, M870/MK1	E1760	M	.2000	.1000	.400
Tool kits and sets, various	E2010	T,E	NL	NL	.060
	thru				
	E3120				

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80

2 - Subclass commodity designator, all items Type E material

B - Ground support K - Tactical vehicles

G - Electronics M - Weapons F - General supplies T - Industrial supplies

3 - CARF not evaluated

## Logistic Planning Factors and Usage Rates

### CLASS III - PETROLEUM, OILS, AND LUBRICANTS

POL CONSUMPTION IS EXPECTED TO DECREASE MARKEDLY DURING AN URBAN DEFENSE AS UNITS CONDUCT COMBAT AND LOGISTIC OPERATIONS WITHIN THE CONFINES OF SYN CITY. POL CONSUMPTION DURING MCATF OPERATIONS WILL EXCEED ESTIMATES GENERATED BY TAM (NAVMC 1017) METHODOLOGY.

The Class III section of Volume I Chapter VII provided introductory information concerning the different types of Class III products and existing methodologies for estimating bulk POL consumption. This section will focus on the consumption of bulk fuel products (MOGAS, DF-2,JP) during the defense of SYN City. Consumption parameters are based on the adoption of Mission 6, as this defensive concept was considered by analysts to be the most viable and supportable in terms of VII MAF equipment and capabilities. The SYN City defense has been divided into two periods based on the anticipated duration of MCATF operations: Period VI (D+11 through D+15) and Period VII (D+16 through D+40).

The greatest impact of an urban defense on Class III products lies in the reduced consumption of bulk fuels, with corresponding secondary impacts on requirements for other packaged items such as automotive oils, greases, and antifreeze. It is estimated that requirements for acetylene, technical oxygen and carbon dioxide will be at least twice the normal level due to increased use of these gases for obstacle construction and localized firefighting. Current planning factors for preservatives, argon, and refrigerant gases should be adequate during an urban defense. Neither coal nor coke will be embarked by VII MAF as these products are locally available and used for civil support.

During the course of the analysis of urban offensive operations, analysts concluded that neither of the two existing bulk fuel computational methodologies (USMC, US Army) provided the level of sensitivity required to quantify changes in bulk fuel consumption due to offensive operations conducted principally in an urban environment. A new methodology was developed that was more sensitive to USMC (VII MAF) equipment densities and equipment utilization patterns anticipated during an urban offense. This methodology has been further refined to model and predict MOGAS and DF-2 requirements during an urban defense. Estimated consumption requirements per equipment category and consumption period are given in Appendix A of this document and are summarized at the end of this section.

### Urban Peculiarities

Defensive operations conducted within an urban environment will significantly effect the consumption of Class III (W) bulk products. The drop in fuel consumption stems from the combined influences of many factors. Factors given below apply directly to the SYN City defense but may be applicable to the defense of other urban areas. It could be noted that the Syn City defense (Mission 6) commences on D+11 following the amphibious assault, seizure, and consolidation of the city.

- Most urban defenses will involve the use of MCATFs conducting delaying operations forward of the FEBA. Bulk fuels used during these operations must be included in the overall Class III(W) planning factor.
- All tactical operations within SYN City occur within a radius of 10 km from the SYN City geocenter.
- Unit displacements during the course of the urban defense will usually be measured in terms of blocks rather than many kilometers.
- Forward stockage of supplies coupled with the small operational radius will serve to decrease round-trip resupply distances when compared to those occurring in a conventional environment.
- Tanks, LVTs, and self-propelled howitzers will accumulate less mileage during an urban defense than in an open environment.
- Requirements for engineering equipment are not significantly changed. An urban environment is an engineer's paradise with respect to obstacle construction and preparation of strongpoint defenses.
- The extent of fixed-wing aviation operations based from within the city depends on the location and vulnerability of the city airfields to enemy indirect-fire weapons and ultimately to the enemy scheme of maneuver.
- Many small-unit operations will be conducted by dismounted infantry armed with man-portable weapons. Combat vehicles will provide fire support from positions in and amongst city buildings.
- Viable utility interfaces may reduce fuel requirements for water purification and electrical generating equipment.
- Fuel requirements will be further reduced if the defending force is compelled to yield urban terrain and establish defensive positions within a smaller geographic area.

## Logistic Planning Factors and Usage Rates

### Class III - Petroleum, Oils, and Lubricants (Continued)

#### Computational Methodology

The computational methodology used to estimate VII MAF ground fuel consumption during the SYN City defense (D+11 to D+40) remains basically the same as that employed during the offensive analysis. Minor modifications to the offensive methodology were deemed necessary to make the model more sensitive to the specific defensive mission selected (Mission 6) and the equipment utilization parameters expected to result during the execution of that mission. As was the case during the previous analysis, the existing USMC fuel estimation methodology, with factors presented in NAVMC 1017, was not mission-sensitive and would not have provided the level of detail necessary during the different periods of the defensive battle.

The ground fuel consumption model, as developed herein, was required to be sensitive to the following factors:

- Radius of combat action for GOP MCATFs and VII MAF (-) units defending within SYN City.
- Distance to major logistic support activity (CSSA).
- Individual equipment item fuel consumption parameters.
- Realistic equipment utilization factors by equipment category and period of defensive action.
- Anticipated duration of MCATF operations within the 30-day defensive period.

The location and combat action of VII MAF subordinate units was examined in relation to the combat capabilities attributed to the advancing Aggressor forces. Major unit locations and bases of operation were then related to a radius of combat action and the distance to the nearest major logistic activity i.e., CSSA.

- GOP MCATFs "A" and "B" - Radius of action - 20.0 km; resupply distance - 40 km.
- VII MAF (-) - Radius of action - 2.4 km; resupply distance - 4.1 km.

The model is structured so that these distance values may be changed should unit or logistic locations change during the course of the SYN City defense.



All items of fuel-consuming equipment organic to VII MAF were categorized with respect to similarity of utilization and fuel consumption parameters. Fuel consumption factors for displacing vehicles in NAVMC 1017 (Rev. #6) and FM 101-10-1 (July 1976 w/Ch 1) were interpolated where necessary and expressed in terms of gallons per kilometer. Fuel consumption values for stationary equipment items were taken directly from NAVMC 1017 (expressed as gpd). The table below shows the equipment categories and associated fuel consumption parameters. Derivation of the displacement equations will be discussed in pages following.

EQUIPMENT ITEM	CALCULATE DISPLACEMENT	FUEL CONSUMPTION FACTOR DURING DISPLACEMENT (MCATF SYN CITY) (GPK)	IDLE TIME (HRS) (MCATF SYN CITY) (GPK)	FUEL CONSUMPTION FACTOR AT IDLE (GPH)	DAILY CONSUMPTION (GAL)	TAM CONSUMPTION (GAL)	REPRESENTATIVE ITEM (CURRENT TIME PERIOD)	POTENTIAL MID-RANGE REPLACEMENT
1. TANK (D)	4 OR	192.77	20.35	28	●	100	M80A3	•
2. LVTC, P (D)	5.2R	68.31 <sup>a</sup>	20.35	8 <sup>a</sup>	●	128	LVTP 7	•
3. LVTR (D)	$36D / ((2D - 10) \cdot 4)$	10	N/A	N/A	●	150 <sup>a</sup>	LVTR 1	•
4. M88A1 (D)	$36D / ((2D - 10) \cdot 4)$	125	N/A	N/A	●	100	M88A1	•
5. M578 (D)	$36D / ((2D - 10) \cdot 4)$	46	N/A	N/A	●	46	M578	•
6. SP HOW (D)	2.0R	4	10.25	10 <sup>a</sup>	●	30	M110A2	•
7. HVY CGO (D)	$36D / ((2D - 15) \cdot 67)$	125	N/A	N/A	●	42.84	M64A2C	•
8. LT CGO (D)	$36R / ((2R - 15) \cdot 5)$	08	N/A	N/A	●	32	M661	•
9. MTV (M)	$36R / ((2R - 15) \cdot 67)$	2	N/A	N/A	●	37.2	M118A1	•
10. LT CGO (M)	$36R / ((2R - 15) \cdot 5)$	08	N/A	N/A	●	16.4	M880	•
11. LT UTILITY (M)	$36R / ((2R - 15) \cdot 5)$	04	N/A	N/A	●	12	M151A2	•
12. MHE (D)	N/A	N/A	N/A	N/A	48	48	MC 4000	•
13. GEN (D)	N/A	N/A	N/A	N/A	60	60	MEP 114A	•
14. ENGR CONST (D)	N/A	N/A	N/A	N/A	60	60	MC 1150	•
15. HVY CRANE (D)	N/A	N/A	N/A	N/A	96	96	ORON 2500	•
16. MISC ENGR (M)	N/A	N/A	N/A	N/A	18	18	M121A1	•
17. LAUNDRY BATH (D)	N/A	N/A	N/A	N/A	160 <sup>a</sup>	160 <sup>a</sup>	M532	•
18. AAFS (D)	N/A	N/A	N/A	N/A	700	700	M89HC	•
19. TAFDS (M)	N/A	N/A	N/A	N/A	52.5	52.5	M1966	•
20. HERS (M)	N/A	N/A	N/A	N/A	15	15		•
21. MF 40 (GSE) (D)	N/A	N/A	N/A	N/A	18	18	MF40	•
22. SPEC HVY CGO (D)	$21.6D / ((2D - 15) \cdot 1)$	125	N/A	N/A	●	31.98	M49A2C	•
23. LT CRANE (D)	N/A	N/A	N/A	N/A	32	32	1581 WF	•

#### NOTES

<sup>a</sup> ESTIMATED OR INTERPOLATED FROM AVAILABLE DATA

<sup>b</sup> ESTIMATED COMBAT IDLE TIME

● CALCULATED BASED ON DISPLACEMENT EQUATION AND RELEVANT R/D VALUES

Figure VII-1. Fuel Consumption Categories and Consumption Parameters

## Logistic Planning Factors and Usage Rates

### Class III - Petroleum, Oils, and Lubricants (Continued)

#### Displacement Equations

Since the fuel consumption was to be based on the daily displacement of individual equipment items (except stationary equipment), it was necessary to derive displacement equations for each major vehicle category. These displacement equations were based on the radius of combat action (R) and the resupply distance (D) envisioned during Operation BREAKER SIX and would require modification should other AOAs\* and tactical concepts be utilized. All equations express daily displacement distances noted by T (total daily displacement).

#### Displacement For Tanks, LVTs, SP Howitzers

	<u>Tank</u>	<u>LVT</u>	<u>SP Howitzer</u>
Displacement SYN City to GOPL (km)	40	40	40
Daily MCATF Displacement (km)	64	93	20
Displacement GOPL to SYN City (km)	40	40	40
Total MCATF Displacement (5 Days)	400	545	180
MCATF Combat Radius (R) (km)	20	20	20
MCATF Displacement Equation	4.0 R	5.45 R	1.8 R
SYN City Daily Displacement (km)	9.5	12.5	5.0
SYN City Combat Radius (R)	2.4	2.4	2.4
SYN City Displacement Equation	3.96 R	5.21 R	2.08 R
Overall Displacement Equation	4.0 R	5.2 R	2.0 R

The vehicles noted above would periodically require idling of main engines to charge batteries, perform essential maintenance, and maintain hydraulic integrity. These factors have been considered during the development of this methodology.

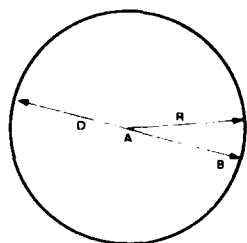
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\*Amphibious Objective Areas

### Displacement for Other Vehicles

Time-distance factors involving relevant R and D distances have been used to estimate total daily displacement. The basic equations are similar and are structured so that the vehicles will accumulate a maximum amount of mileage during a specified time period, i.e., 18 hours. Minor differences in the equations arise from the intended vehicle use (retrieval, resupply, internal liaison, etc.), vehicle loiter time, and vehicle displacement rate.

If a vehicle travels within a certain radius of action, an average trip will consist of movement from point A to point B, accomplishing the assigned mission at point B, and then returning to point A. The derivation of the general time-distance equation is shown below.



Variables: Displacement rate -  $r$   
Distance/Round trip -  $2R$  (or  $2D$ )  
Total time/Round trip -  $t$   
Loiter time/Round trip -  $L$   
Maximum trips/day -  $N$   
Total displacement/day -  $T$

$$rt = 2R \quad t = 2R/r + L \quad N = 18 \div (2R/r + L)$$

$$T = 2R \times N \quad \text{or} \quad T = 36R \div (2R/r + L)$$

This general equation is used, with minor modifications, to model fuel consumption for tracked retrievers, heavy cargo vehicles (5T, 10T), light cargo vehicles (1 1/4T), utility vehicles, marginal terrain vehicles, and special heavy cargo vehicles (M49A2C, M50A2, M543). Specific displacement equations are given below.

- Tracked retrievers-- $T = 36D \div (2D/10 + 4)$ .
- Heavy cargo vehicles-- $T = 36D \div (2D/15 + .67)$ .
- Light cargo, utility vehicles-- $36R \div (2R/15 + .5)$ .
- Marginal terrain vehicles-- $36R \div (2R/15 + .67)$ .
- Special heavy cargo vehicles-- $21.6D \div (2D/15 + 1)$ . (Weighting factor of .6 applied to D value.)

## Logistic Planning Factors and Usage Rates

### Class III - Petroleum, Oils, and Lubricants (Continued)

The fuel computation module has been programmed in BASIC into a Tektronix mini-computer. The program and detailed output are shown in Appendix A to this document. For each major location to be considered, values for the combat radius, resupply distance, and number of days in the period must be inputted. The program will then "ask" for the number of items in each equipment category. Finally, the operator chooses the output format--either suppressed or standard. Samples of the output are shown below (suppressed) and opposite (standard).

The program calculates vehicle displacement, multiplies by the appropriate fuel usage factors, and then multiplies by the equipment item density. These values are shown under the CALC CONSUMPTION columns. (The program also discriminates between vehicles requiring MOGAS or diesel fuel and places the calculated fuel consumption under the appropriate column.) The calculation is then repeated for each equipment category using TAM fuel consumption values. Ratios between SYN City calculated consumption and TAM calculated consumption are listed. The program then sums all fuel consumption and multiplies by the number of days in the period. A 15 percent waste factor is included in the fuel totals.

Two options built into the program include the suppression of the print format and the summing of fuel consumption from multiple locations. The suppressed format is useful when only the consumption totals are required and consumption by individual equipment category is not as important. Summing fuel requirements from multiple locations can be used to develop storage requirements at logistic support areas.

#### FUEL USAGE COMPARISON - CLASS III(W)

PERIOD VI

LOCATION: MOBIT

RADIUS OF ACTION= 20 00 KILOMETERS

RESUPPLY DISTANCE= 40 00 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

SYSTEM	QUANTITY	CALC.	TAM	RATIO	CALC.	TAM	RATIO
I D.	IN AFR	CONSUMPTION	CONSUMPTION	OF	CONSUMPTION	CONSUMPTION	OF
		(MOGAS)	(MOGAS)	CALC/TAM	(DIESEL)	(DIESEL)	CALC/TAM
CONSUMPTION TOTALS=		3642 10	4162 54	0 87	50208 02	49771 45	1 01
FOR 5 DAYS, TOTALS=		18200 51	20812 70		251040 10	248857 01	
MID-RANGE IMPACT =		200 10	200 10	1 00	50648 02	53733 04	1 00
FOR 5 DAYS TOTALS=		1000 50	1000 50		266240 11	268669 01	

Figure VII-2. Class III(W) Analysis - Suppressed Format Sample

# FUEL USAGE COMPARISON - CLASS III(W)

PERIOD: VI

LOCATION: MCATF

RADIUS OF ACTION= 20.00 KILOMETERS

RESUPPLY DISTANCE= 40.00 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

	SYSTEM I.D.	QUANTITY IN AREA	CALC. CONSUMPTION (MOORS)	TAM CONSUMPTION (MOORS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
	1	140	0.00	0.00	0.00	22288.00	14000.00	1.59
	2	110	0.00	0.00	0.00	7955.20	13750.00	0.58
1 TANK (D)	3	2	0.00	0.00	0.00	240.00	300.00	0.80
2 LVTC P (D)	4	10	0.00	0.00	0.00	1500.00	1000.00	1.50
3 LVTR (D)	5	5	0.00	0.00	0.00	270.00	225.00	1.20
4 MBSA1 (D)	6	24	0.00	0.00	0.00	408.00	720.00	0.57
5 MS78 (D)	7	100	0.00	0.00	0.00	3238.20	4605.12	0.70
6 SP HOW (D)	8	32	0.00	0.00	0.00	582.06	1024.00	0.57
7 HVY CGO (D)	9	20	863.14	744.00	1.16	0.00	0.00	0.00
8 LT CGO (D)	10	14	254.65	229.00	1.11	0.00	0.00	0.00
9 MTV (M)	11	206	1873.52	2472.00	0.76	0.00	0.00	0.00
10 LT CGO (M)	12	24	0.00	0.00	0.00	1152.00	1152.00	1.00
11 LT UTILITY (M)	13	60	0.00	0.00	0.00	3600.00	3600.00	1.00
12 MNE (D)	14	25	0.00	0.00	0.00	1560.00	1560.00	1.00
13 GEN (D)	15	2	0.00	0.00	0.00	192.00	192.00	1.00
14 ENGR CONST (D)	16	8	144.00	144.00	1.00	0.00	0.00	0.00
15 HVY CRANE (D)	17	0	0.00	0.00	0.00	0.00	0.00	0.00
16 MISC ENGR (M)	18	0	0.00	0.00	0.00	0.00	0.00	0.00
17 LAUNDRY BATH (D)	19	0	0.00	0.00	0.00	0.00	0.00	0.00
18 AAFS (D)	20	2	30.00	30.00	1.00	0.00	0.00	0.00
19 TAFDS (M)	21	0	0.00	0.00	0.00	0.00	0.00	0.00
20 HERS (M)	22	32	0.00	0.00	0.00	545.68	1023.36	0.53
21 MF40 (GSE) (D)	23	4	0.00	0.00	0.00	128.00	128.00	1.00
22 SPEC HVY CGO (D)								
23 LT CRANE (D)								
CONSUMPTION TOTALS=			3648.10	4162.54	0.87	50208.00	49771.40	1.01
FOR 5 DAYS, TOTALS=			18240.51	20812.70		251040.10	248857.01	
MID-RANGE IMPACT =			200.10	200.10	1.00	53648.00	53733.84	1.00
FOR 5 DAYS, TOTALS=			1000.50	1000.50		268240.11	268669.21	

Figure VII-3. Class III(W) Analysis - Standard Format Sample

## Logistic Planning Factors and Usage Rates

### Class III - Petroleum, Oils, and Lubricants (Continued)

#### Class III(W) Conclusions and Recommendations

Calculated ground fuel usage for the current and mid-range periods is shown in the table opposite. These totals do not include fuels consumed by Navy elements, Naval Support Forces, or recommended augmentations to VII MAF. (Military Police and Civil Affairs units augmenting VII MAF are not expected to increase fuel requirements to any great degree.) The fuel totals indicate that anticipated MOGAS consumption is 56 percent of what would be calculated for the same equipment densities using TAM methodology. Anticipated diesel fuel consumption is 66 percent of the corresponding TAM value. The continuing trend towards dieselization of ground tactical vehicles is expected to significantly reduce mid-range MOGAS consumption.

Detailed fuel comparisons and calculations for both MCATFs and VII MAF in SYN City (in Period VI) and VII MAF (Period VII) are provided in Appendix A to this document. Both expanded and suppressed formats are given as well as a listing of the computer programs used to generate the data. Equipment densities during each period were based on a subjective evaluation of the percentage of each equipment category that would be in actual use vice the actual total of equipment items in that category. These evaluations stem from more detailed planning considerations prepared in Chapter V. The program is structured so that these equipment densities, or percentage utilizations, may be changed to reflect different tactical and logistic concepts. The basic methodology has potential for refinement in several areas but provides a displacement-sensitive method for comparison with existing USMC calculation processes.

Ground fuel calculations, by this methodology, lead to several conclusions concerning fuel consumption, fuel storage, and environmental influences upon fuel consumption during the defense of an urban area such as SYN City.

- Methodologies for predicting fuel consumption would be more useful for detailed planning if they were more sensitive to the actual tactical situation with associated unit displacements and vehicle usage patterns anticipated during an urban defense.
- Extensive MCATF operations in conventional terrain outside SYN City may result in fuel requirements that would not be anticipated using the TAM methodology. This is clearly seen in the expanded consumption tables provided in Appendix A. The overall ratio of SYN City calculated consumption to TAM consumption was .83 during Period VI when MCATFs are conducting delaying operations forward of the FEBA. The TAM methodology would be adequate to predict the total diesel fuel requirement but not the distribution of this fuel between MCATF and SYN City units.

- Prolonged defensive operations wholly contained within an urban area will require approximately 1/3 less fuel than calculated by the existing TAM methodology. Actual experience gained during the assault and consolidation phases of the overall SYN City operation would normally serve as the basis for predicting future fuel requirements in the city. The fuel predictions for Periods I through V (Volume I) are of the same order of magnitude as those for Periods VI and VII.
- Fuel storage systems should be established to hold a minimum of 20 DOS predicted by a displacement-sensitive methodology. It is coincidental that the initial storage requirements, predicted by using established gal/men/day factors, were adequate to store 20 DOS of fuel predicted by the revised methodology.
- Consumption calculations from the USMC and new methodologies are of the same order of magnitude indicating that the existing planning factors are adequate to provide broad planning guidance for overall fuel requirements during an urban defense.
- It is recommended, however, that efforts be undertaken to revise the existing fuel prediction methodology to provide additional sensitivity for specific tactical environments and corresponding equipment utilizations.

TABLE VII-3. CALCULATED CLASS III(W) CONSUMPTION DURING OPERATION BREAKER SIX

PERIOD	SYN CITY MOGAS	TAM MOGAS	RATIO SC/TAM	SYN CITY DIESEL	TAM DIESEL	RATIO SC/TAM
VI	43,480 (12,955)	66,407 (12,955)	.65 (1.0)	869,497 (900,022)	1,043,030 (1,096,482)	.83 (.82)
VII	115,486 (50,629)	215,228 (50,629)	.54 (1.0)	2,370,233 (2,435,090)	3,860,018 (4,024,618)	.61 (.61)
TOTAL	158,966 (63,584)	281,635 (63,584)	.56 (1.0)	3,239,730 (3,335,112)	4,903,048 (5,121,100)	.66 (.65)

NOTE 1 - Parenthetical numbers refer to mid-range quantities.  
 2 - Consumption values given are totals for that period.

## Logistic Planning Factors and Usage Rates

### Class III - Petroleum, Oils, and Lubricants (Continued)

#### Class III(A) Requirements

Consumption of aviation fuel during the course of any tactical operation will be influenced by the types of aircraft employed, the sortie rate for each type aircraft, and the munitions load and flight profile during each sortie. An effort of this magnitude during each phase of the SYN City defense was beyond the scope of this contract and established planning factors, given in the MAGTF Lift Validation study and Logistic Planning Data volumes, were used to estimate Class III(A) requirements resulting from the basing of the 7th MAW assets.

Throughout the course of this defensive analysis, several crucial assumptions were made relative to the conduct of air operations in or near SYN City. These assumptions are considered valid for the SYN City defensive scenario, but would require reevaluation in other defensive scenarios.

- Damage to SYN City airfields during the course of offensive operations was such that the arrival of Fly-In Echelons was delayed until D+11 so that necessary repairs could be effected to landing surfaces.
- The change to a defensive mission on D+11, coupled with the new Aggressor threat for the defensive mission, led analysts to question the survivability of MAW assets within the FBH once Aggressor forces began to close on the FEBA (Mission 6).
  - A heavy use of air support is required during Period VI (D+11 to D+15) when MCATFs are conducting delay operations forward of the FEBA to gain time for defensive preparations within the city. FIE #1 was deployed from the TAB into the FBH to increase the number of sorties flown against advancing Aggressor armored columns.
  - The location of SYN City airfields is such that Aggressor penetrations of the FEBA will undoubtedly deny the use of these surfaces to VII MAF. It was projected that the airfields would become untenable on or about D+16.
- The overall plan for MAW basing thus included the arrival of FIE #1 on D+11, as originally planned, followed by the redeployment of the majority of 7th MAW late on D+15. MAW assets remaining the FBH subsequent to D+15 would operate from dispersed V/STOL facilities within the city once the airfields become untenable.



The table below shows the basing of 7th MAW during Periods VI and VII of the SYN City defense as well as associated fuel requirements (using established planning factors) for these assets. More detailed fuel predictions would be possible once the actual basing of aviation assets was known and flight profiles were prepared.

TABLE VII-4. CLASS III(A) DAILY REQUIREMENTS DURING SYN CITY DEFENSE

SQUADRON TYPE	PERIOD VI				PERIOD VII			
	SYN CITY		TAB		SYN CITY <sup>2</sup>		TAB	
	# SQDN	GAL	# SQDN	GAL	# SQDN	GAL	# SQDN	GAL
HMH	5	50,080	-	-	2	20,032	3	30,048
HMM	8	43,392	-	-	4	21,696	4	21,696
HML	1	5,688	-	-	1	5,688	-	-
HMA	2	11,616	-	-	2	11,616	-	-
VMA(V)	2	48,480	1	24,240	2	48,480	1	24,240
VMA(AW)	1	18,900	2	37,800	-	-	3	56,700
VMFA	5	152,520	2	61,008	-	-	7	213,528
VMFP	-	-	Det	18,562	-	-	Det	18,562
VMAQ	2/3	9,459	1/3	18,918	-	-	1	28,377
VMGR	-	-	2	85,252	-	-	2	85,252
VMO	1/3	2,844	1/3	1,422	-	-	1	4,266
TOTAL <sup>1</sup>	-	394,426	-	284,282	-	123,639	-	555,069

NOTE 1 - Includes 15% waste factor in all totals.

2 - Class III(A) storage facilities during Period VII were based on the storage of 20 DOS for these assets.

## Logistic Planning Factors and Usage Rates

### CLASS IV - CONSTRUCTION MATERIALS

IMPLEMENTATION OF AN EFFECTIVE BARRIER PLAN REQUIRES SUBSTANTIAL QUANTITIES OF CLASS IV MATERIALS IN ADDITION TO THOSE EMBARKED AND LANDED TO SUPPORT OFFENSIVE OPERATIONS. INDIGENOUS CLASS IV MATERIALS WILL BE EXPLOITED TO THE MAXIMUM EXTENT POSSIBLE.

#### General

Construction materials will be required to support defensive operations in the areas of survivability enhancement, barrier construction, drainage improvement, and the restoration and continued maintenance of lines of communication including airfield surfaces. Over 90 percent of the Class IV tonnage required to support the SYN City offense consisted of AM-2 matting earmarked for the upgrading of Airfield 2 and the total surfacing of EAF 3, which was not constructed due to the change in mission on D+10. Another 7 percent of the Class IV tonnage consisted of steel stock used to harden positions and construct mobility barriers. The analysis of defensive Class IV requirements will be based on the tactical and logistic concepts envisioned for Mission 6 and assuming that GOP forces will be forced to withdraw inside the FEBA on or about D+16.

A number of Class IV items can normally be found in an urban environment. Culvert, fencing, steel stock, cement, and lumber are required for general construction work and would be found in virtually any moderate-size city. These materials would probably be located at independent contracting concerns dispersed throughout the city as well as centralized bulk materials storage yards. Two such bulk materials storage areas are noted in the SYN City Data Base. One area is located immediately south of the prison complex while the other area is located two kilometers west of the train station. The SYN City Data Base does not provide detailed information concerning the specific type or quantity of Class IV materials available in SYN City. Such information might be available from in-country agents and aerial photography prior to an amphibious assault; from reconnaissance and inventory during consolidation and/or defensive phases.

Class IV material requirements are expected to increase during the mid-range period due to increased weapons effectiveness and improved Threat breaching systems. Defensive positions will require greater hardening measures to reduce ballistic penetration and provide the requisite level of protection against fragmentation and blast effects. An increased reliance upon sophisticated electronic command and control systems will require that these systems be provided with an adequate level of protection against hostile fires. The SYN City area is expected to grow during future decades and local materials will continue to be available in the mid-range period.

Originally, when VII MAF/Landing Force was given the mission to conduct an amphibious assault into SYN City, the mission stated that VII MAF was to be prepared to continue the attack to the northwest. No mention was made of any future mission involving the deliberate defense of SYN City against a new and larger threat. Class IV materials were embarked in such quantities as were necessary to support offensive operations including the localized establishment of hasty defenses. On D+10 VII MAF received the defensive mission and elected to defend inside the city (except in Mission 11). The additional Class IV materials required to establish effective countermobility barriers and survivable defensive positions must be available and on site no later than D+12.

Class IV materiel requirements necessary to support the SYN City offense were estimated in Volume I of this study effort and summarized in Figure VII-8 of that document. Due to the abrupt change in the VII MAF mission, some of those Class IV items may not have been utilized by D+10 when the MAF was directed to assume a defensive posture. Class IV items not utilized during the 10-day offensive period are estimated below categorized by the intended function performed.

- Hardened Positions - All sandbags, fence posts, and plastic sheeting utilized. Lumber and steel sheet unavailable during early stages of the amphibious assault and not required when available on D+6.
- Mobility Barriers - All wire deployed. All lumber noted was used to barricade building entrances. Deployment of steel post and tetrahedron obstacles not realized due to nonavailability of engineer resources.
- Landing Surfaces -  
AF 1 - Matting installed; 1500 bags SILIKAL used.  
AF 2 - Approximately 1 million SF matting installed.  
EAF 3 - Construction had not begun by D+10. No matting installed.  
V/STOL Sites - V/STOL sites not prepared by D+10. No matting installed.
- Drainage - All drainage materials installed or sited at problem areas and awaiting engineer resources.
- LOCs - Rehabilitative efforts utilized indigenous materials for road and bridge repair. Damage to the rail system was not repaired during the offensive period.

Logistic Planning Factors and Usage Rates

CLASS IV - Construction Materials (Continued)

Defensive Class IV Requirements (Additional)

Hardened Positions - Urban - See Figure V-1.  
- Sandbags - 9047 bundles  
- Lumber and sheet steel available from offensive operations

Nonurban - Aggressive and fluid MCATF operations preclude the establishment of extensive hardened defensive strongpoints

Mobility Barriers - Urban - See Table V-2.  
- 22.9 Km 3S Concertina, 11.4 Km Concertina  
Materials  
229 - Reels barbed wire - 92  
4,505 - Concertinas-GPBT0 - 1,794  
12,213 - 60" Post - 4,864  
305 - 32" Post - 122  
- 192 "Auto Cribs" @ 75'-1/2" wire rope, 6-2' pickets  
- 48 overturned RR cars @ 50'-1/2" wire rope, 4-2' pickets  
- 250 sheets 1/2" plywood, 1000 2"x4"x10'

Nonurban - See Table V-1.  
- 880 reels barbed wire, 961 GPBT0 concertinas  
- 11,380 60" post; 12,649 32" post

Landing Surfaces - Matting required for the equivalent of four V/STOL facilities (dimensions as per ECP 4-4, p. B-18).  
986,400 SF matting (3,425 bundles)

Drainage - No additional materials required. Indigenous stocks.

LOCs - No additional materials required. Indigenous stocks.

TAMCN	ITEM DESCRIPTION	UNIT	PREPARE HARDENED POSITIONS	CONSTRUCT MOBILITY BARRIERS	IMPROVE LANDING SURFACES REPAIR AT DAMAGE	CORRECT DRAINAGE	MODIFY REPAIR BUILDING STRUCTURES	REPAIR DAMAGE TO LOC.	TOTAL QUANTITY	TOTAL WEIGHT (ST)	REMARKS
U3010	BAG, BURLAP	PKG	9047			•			9047	113 1	1
	BARBED WIRE, 400M	REEL		1201					1201	11 3	1
U3040	GPBTO	CONCER		7260					7260	23 1	1
	MAT SET, AM2	BUNDLE			3425 •		★				1
U3180	PIPE, CULV. 18"	EACH				•			•		2
U3190	PIPE, CULV. 36"	EACH				•			•		2
U3210	POST, FENCE, 32"	EACH		13076		•			13076	32 8	1
U3220	POST, FENCE, 60"	EACH		28457		•			28457	128 1	1
J3090	LUMBER (2"X4"X10')	EACH	•	1000		•	★		1000	8 9	2
	LUMBER (4"X8"PLY)	EACH		250			★		250	10 7	2
J3035	CEMENT, PORTLAND	BAG		★							2
J3200	ROOFING FELT	ROLL					★				2
	SHEET STEEL 1/4"	SHEET	•						•		2
	RAILROAD TRACK	KM.									2
K4720	PLASTIC SHEET	ROLL					★		•		1
	STEEL STOCK, L	KM							•		2
	SILICAL	BAG							•		1
J3365	WIRE ROPE 1/2" DIA	REEL		168					168	20 6	1
TOTAL										348 6	

★ ALTERNATE USE. DEPENDS ON QUANTITIES USED TO SATISFY OTHER REQUIREMENTS

1 ITEMS ARE COMBAT ESSENTIAL AND MAY NOT BE LOCALLY AVAILABLE. MUST BE EMBARKED

2 ITEMS ARE LOCALLY AVAILABLE. CONTINUING INVENTORIES WILL BE UTILIZED TO DETERMINE LOCAL STOCKAGE LEVELS.

• QUANTITIES LANDED BUT NOT UTILIZED DURING OFFENSIVE PHASE. AVAILABLE FOR DEFENSE OPNS

Figure VII-4. Construction Materials Required to Support Defensive Operations in SYN City

## Logistic Planning Factors and Usage Rates

### CLASS V - AMMUNITION

CLASS V CONSUMPTION DURING AN URBAN DEFENSE WILL REFLECT THE UTILIZATION OF THOSE WEAPONS AND ITEMS FOUND TO HAVE PARTICULAR UTILITY AND EFFECTIVENESS IN THE URBAN ENVIRONMENT.

Introductory information concerning ammunition usage in an urban environment was provided for offensive operations (Volume I) and remains valid, in a general sense, for defensive operations in that same environment. This section will focus on the peculiarities of an urban defense as they relate to the usage of Class V items. The base case mission, Defense Inside the City, and the logical assumptions concerning the conduct of that defensive mission, serve as the basis for this discussion. Ammunition requirements supporting a Defense Outside the City are determined principally by the terrain and associated combat operations in that environment rather than the urban environment.

Analysts viewed the inner-city defensive missions as consisting of two entirely dissimilar phases or periods of action. The first period contains the action of GOP forces in the MAF Security Zone lasting from the issuance of the defensive mission to the time that those forces are compelled to withdraw inside the FEBA. This combat period is not directly influenced by the urban environment in which the bulk of the MAF defenses are established. The second phase of the urban defense begins once the GOP forces have withdrawn within the FEBA and Aggressor lead elements approach (within several kilometers) the FEBA. The duration of this phase is indeterminate and would last until one of the two combatants was forced to withdraw from direct contact.

Ammunition usage during an urban defense is highly dependent upon the specific terrain in which the forward defensive positions are sited and the specific schemes of maneuver in that terrain for both defending (VII MAF) and assaulting (Aggressor) forces. During the analysis of offensive actions by VII MAF/Landing Force, doctrinal Aggressor units (totalling less than reinforced battalion size) defending the SYN City area were logically sited in the main port and at Airfield 1. These areas are well-delineated on the SYN City Base Map and logical mini-scenarios were developed for these actions. The remainder of combat actions during the SYN City offense involved partisan forces (or MRB remnants) conducting irregular actions against the Landing Force. The relatively limited size of the offensive conflict, in comparison with the newly designated multi-divisional threat, facilitated the development of detailed mini-scenarios from which Class V(W) types and quantities could be extracted.

The SYN City inner-city defense (Period VII) will be decided in the suburban areas within several kilometers distance of the metropolitan boundary. Aggressor penetrations into either of the urban areas (New City, Old City) or the main port area will fragment the MAF defensive structure, limit or deny logistic operations, and possibly force VII MAF to conduct a staged amphibious withdrawal. A coordinated three-division Aggressor attack of the SYN City FEBA would certainly involve major penetrations into suburban areas. The MAF response to these penetrations is influenced by the Aggressor scheme of maneuver and the terrain/structures available upon which to base a hasty defense until the FEBA is restored. The development of defensive mini-scenarios detailed enough to model the tactical situation and provide detailed Class V(W) type and quantity information was attempted but found to be especially costly in terms of analytical resources available. A Delphi approach was finally selected with the Period VI SYN City-only expenditure based on offensive mini-scenarios and the Period VII total expenditure based on historical expenditure rates in conventional terrain.

The subparagraphs below summarize some of the considerations peculiar to the SYN City defense. These considerations are expected to have a significant impact on the level and composition of ammunition items required to sustain defensive actions against a numerically superior assaulting force.

- Virtually all combat actions with doctrinal Aggressor forces will occur in suburban areas on the metropolitan fringe of SYN City.
  - Penetration in force of New City, Old City, or CSSA 1 would reduce the defensive options available to VII MAF and possibly force an amphibious withdrawal.
  - Of the four major industrial areas in SYN City; 2 of the 4 are outside the FEBA, 1 is inside a likely penetration zone, and the main port is at the "heart" of the MAF defense. It is not anticipated that any major or prolonged combat actions will occur in any of these areas.
- All mini-scenarios (except Urban Doctrinal), developed during the offensive analysis, remain valid during the SYN City defense and are applicable to the actions of partisan forces, MRB remnants, and/or other Aggressor elements inserted into SYN City.
- MCATF operations forward of the FEBA (Period VI) are intended to blunt the Aggressor advance, force early deployment, attrite armor, and gain time for defensive preparations within the city. It is anticipated that the combination of MCATF and extensive fighter/attack missions, flown by 7th MAW, will reduce the Aggressor armor and artillery capability to a level such that a "Reduce Defenses" option is not available to him.

## Logistic Planning Factors and Usage Rates

### Class V - Ammunition (Continued)

#### Class V(A) Requirements

Class V(A) expenditures during an urban defense are, as always, influenced by the tactical situation and the value of available munitions against anticipated target types. Tactical considerations affecting aircraft utilization during the SYN City defense were stated on pg. VII-16. The basing of 7th MAW assets during Periods VI (D+11 to D+15) and Period VII (D+15 to D+40) is shown in the table opposite. It should be noted that the denial of Airfields 1 and 2 requires that all high-performance aircraft be based outside the city; dispersed V/STOL facilities will be prepared for squadrons remaining within the city.

Virtually all expenditures during Period VI (MCATF Operations) will be directed at formations and target types normal to Aggressor MRDs advancing across conventional (i.e., nonurban) terrain within the MAF Security Zone and forward of the FEBA. Class V(A) planning should utilize currently accepted conventional planning factors. Missions occurring within the city will be more logistically oriented and a low ammunition expenditure is expected.

Period VII (Inner City Defense) begins with untenable airfields and a redeployment of 7th MAW assets. Mission requirements now include the interdiction of advancing forces, air superiority, close air support, and logistic support. Interdiction and air superiority missions will be flown almost exclusively by fixed-wing aircraft based outside the city against targets outside the city; conventional Class V(A) factors are applicable. Close air support will be initially directed against targets immediately outside the city, but these missions would eventually include areas within the metropolitan boundary. The tonnage associated with this mission type is not expected to differ appreciably from conventional factors, although individual munition loads and sortie rates may vary. (The optimum time to engage the enemy is before he reaches the city and begins to use the structures to his advantage). Ammunition expenditures by utility/cargo helicopters is also expected to remain at a conventional level. Class V(A) daily requirements shown in the table opposite were compiled from MAGTF Lift data and other sources.

In summary, the nature of this particular tactical situation heavily influences the tactical situation. The majority of missions will be directed at conventional targets in conventional terrain outside the city. Close air support missions within the city will require a total tonnage approaching conventional planning factors. Conventional supply rates are adequate for rotary wing aircraft considering that their urban defensive utilization parallels their use in a conventional environment.



TABLE VII-5. CLASS V(A) DAILY REQUIREMENTS DURING SYN CITY DEFENSE

SQUADRON	PERIOD VI				PERIOD VII			
	SYN CITY		TAB		SYN CITY <sup>2</sup>		TAB	
	# SODN	SHORT TONS	# SODN	SHORT TONS	# SODN	SHORT TONS	# SODN	SHORT TONS
HMH	5	10.2	-	-	2	4.1	3	6.1
HMM	8	16.3	-	-	4	8.2	4	8.2
HML	1	4.1	-	-	1	4.1	-	-
HMA	2	12.4	-	-	2	12.4	-	-
VMA(V)	2	78.8	1	39.4	2	78.8	1	39.4
VMA(AW)	1	52.1	2	104.2	-	-	3	156.3
VMFA	5	43.5	2	17.4	-	-	7	60.9
VMFP	-	-	Det	-	-	-	Det	-
VMAQ	2/3	-	1/3	-	-	-	1	-
VMGR	-	-	2	-	-	-	2	-
VMO	1/3	1.7	1/3	1.7	-	-	1	5.1
TOTAL	-	219.1	-	162.7	-	107.6	-	276.0

NOTE: Daily requirements for aircraft compiled from MAGTF Lift data, MCDEC logistic handbooks, and 7th MAW TO&E

## Logistic Planning Factors and Usage Rates

### Class V - Ammunition (Continued)

#### Class V(W) Requirements During Period VI

As stated previously, the majority of combat actions during Period VI (D+11 through D+15) will occur forward of the FEBA where GOP MCATFs are conducting delay operations in conventional terrain. Elements of VII MAF(-) remaining in SYN City will be in the process of establishing inner-city defenses and subject to sporadic attacks by irregular forces including those inserted by the approaching Aggressor divisions. Each of these dissimilar actions will be discussed in brief as to their impact on Class V(W) expenditures.

Those units or elements task-organized into MCATFs "A" and "B" will be attempting to delay a numerically superior Aggressor MRD(+) through an aggressive mobile defense including ambushes and artillery raids. Class V(W) planning for these elements is not urban-related and should be based on applicable factors for such action and environment. It should be noted that all tanks and TOWs, 55 percent of the LVTs, and all SP howitzers will be involved in this delaying action.

- HIGH-USAGE Weapons - Tank, TOW, LVT, Arty, DRAGON
- MEDIUM-USAGE Weapons - LAW, Mortars, MG (ground)
- LOW-USAGE Weapons - Pistol, Rifle, M203, Shotgun, Hand Grenades

The most notable Class V(W) requirement during Period VI, from a USMC standpoint, is the prodigious quantity of mines that would be necessary to implement an effective barrier plan designed to canalize Aggressor elements into prepared kill zones. (See Chapter V - Engineer Countermobility - MAF Security Zone for representative mine quantities and associated tonnages). The overall mine requirement is expected to decrease with the fielding of scatterable mine systems; these systems would shift a portion of the mining responsibility to artillery units.

Class V(W) expenditures within SYN City during Period VI are obviously influenced by the combat capabilities of Aggressor elements remaining within or inserted into the city. Considering the ACV threat to SYN City, the Class V(W) expenditure could approach that estimated during the course of the SYN City offense (prorated for a 5-day period). All scenarios developed during the offensive analysis (Volume I Appendix B), except the Urban Doctrinal scenario, could occur within SYN City during Period VI simultaneously with the action of GOP MCATFs. The lower limit for Class V(W) is shown in the table opposite. Expenditures are expressed in terms of percentages of a daily Class V(W) rate established for Periods II through V (D-day through D+10).

TABLE VII-6 . MINIMUM DAILY SYN CITY CLASS V(W) REQUIREMENT DURING PERIOD VI.

<u>WEAPON SYSTEM OR TYPE</u>	<u>MINIMUM DAILY SYN CITY CLASS V(W) RQMNT<sup>1</sup></u>	<u>REMARKS</u>
ARMOR		
TANKS	0%	All with MCATFs
LVTs	10%	55% with MCATFs
ARTILLERY		
Self-Propelled	0%	All with MCATFs
Towed	10%	Note 2
ATGM		
TOW	0%	All with MCATFs
DRAGON, LAW	5%	Few appropriate targets
MORTARS	15%	
INDIVIDUAL WPNS		
MG	15%	} High percentage due to low expenditure during offense
Rifle	20%	
Pistol	100%	
Shotgun	100%	
M203	15%	
GRENADE, HAND		
Frag	15%	
Concussion	10%	
Smoke	10%	
SIGNALS	15%	
MINES	*	} See Chapter V - Engineer Countermobility
DEMOLITIONS	*	

Note 1 - Expressed in terms of percentage of daily offensive (Period II through V) Class V(W) requirement

2 - Virtually all howitzers left within the city will be supporting MCATF operations

## Logistic Planning Factors and Usage Rates

### Class V - Ammunition (Continued)

#### Class V(W) Requirements During Period VII

Period VII commences on D+16 after the anticipated withdrawal of GOP MCATFs inside the FEBA. All units and elements of VII MAF are now deployed within the metropolitan boundary of SYN City. Aggressor lead elements are now reaching the FEBA and "urban-only" defense is ready to begin. Defensive preparations including the installation of inner-city barriers were completed during Period VI - the MAF is now ready to defend SYN City. Class V(W) expenditures during the inner defense of SYN City will be based on factors contained in FM 101-10-1 w/Ch 1 applicable to the defense of a position. (This methodology was necessary due to the size of the newly-designated Aggressor threat, the number of potential penetration points, and the overall level of effort required to quantify the tactical situation and terrain/structural restrictions).

During the analysis of engineer countermobility requirements within the city, up to 25 percent of the total FEBA frontage was estimated to be "open" and basically similar to conventional terrain. The area at Airfield 1 and the southern section of CSSA 2 are examples of obvious open areas as well as much of the area immediately forward of the FEBA. Weapons utilization and firing rates in these areas are not urban-unique. The remainder of the suburban area probably contains an unspecified mix of open areas, residential structures, high-rise buildings, small commercial enterprises, and light industry. Elements of 7th Mar Div will have established defensive strongpoints and kill zones throughout the suburban area.

Ammunition expenditure tables (7-3 through 7-6) given in FM 101-10-1 w/Ch 1 reflect planning factors categorized by weapon and level and type of combat operation with conventional terrain. Analysts elected to use a Delphi technique applied to Table 7-6 of that document to express Class V(W) requirements for divisional elements defending strongpoint positions in the Forward Defense Area. A group of technical analysts familiar with the SYN City model, urban defensive concepts, and actual combat operations was tasked to estimate urban expenditure factors given conventional expenditure rates applicable to the first-day defense of a position. It should be noted that these factors are applicable to divisional weapons systems deployed in the Forward Defense Area; FSSG and aviation units should base their daily requirements on 60 percent of the daily ammunition expenditure rates given for divisional units.

These planning factors should be used for estimating urban defensive Class V(W) expenditures until actual combat experience has been gained during the SYN City defense. Actual knowledge of the suburban terrain could be used to fine-tune ammunition estimates for artillery and ATGM weapons systems.

TABLE VII-7. DAILY CLASS V(W) EXPENDITURES DURING PERIOD VII

WEAPON SYSTEM OR TYPE	RND/SPN FIRST DAY <sup>1</sup>	URBAN DEFENSE FACTOR <sup>2</sup>		REMARKS
		MEAN	STD. DEV.	
ARMOR				
Tanks (Main gun)	62	.85	.0840	Heavy use APFSDS
LVTs (M85)	N/A	1.2	.0894	
ARTILLERY				
Self-Propelled	190	1.0	.0632	} Most howitzers firing } targets forward of FEBA
Towed (155mm)	203	1.0	.0316	
ATGM				
TOW	9	.75	.0707	Urban vulnerability
DRAGON	3	1.25	.1095	
LAW	560	1.5	.1000	
MORTARS	116	1.1	.0922	
INDIVIDUAL WPNS				
MG (M60)	519	2.0	.2025	} Conventional firing } rates applicable
Rifle (M16A1)	118	1.75	.1673	
Pistol	N/A	-		
Shotgun	N/A	-		
M203	26	1.2	.1000	
GRENADE, HAND				
Frag	N/A	} 1.2	} .0894	} Mix: 90% Frag } 10% Concussion
Concussion	N/A			
Smoke	N/A			
SIGNALS	N/A	.85	.0894	
MINES	N/A	Note 3		
DEMOLITIONS	N/A	Note 3		

Note 1 - As given in or interpolated from Table 7-6 FM 101-10-1 w/Ch 1 dated 10 February 1978.

2 - Subjective estimate derived from Delphi technique; expresses an urban defense factor applied to conventional expenditure rates.

3 - Situationally dependent; requires detailed urban terrain analysis.

4 - Succeeding days (D+17, 18, 19, 20) factor - 80% of first day.  
Prolonged period (D+21 through D+40) factor - 33% of first day.

5 - Expenditure factors applicable to heavy intensity in Forward Defense Area.

## Logistic Planning Factors and Usage Rates

### CLASS VI - PERSONAL DEMAND ITEMS

THE RATION SUPPLEMENT SUNDRIES PACK (TAMCN S0060) WILL BE USED TO PROVIDE CLASS VI ITEMS UNTIL SUCH TIME AS AAFES SUPPORT IS AVAILABLE IN THE FBH. LOCAL PURCHASE OF CLASS VI ITEMS WILL BE CURTAILED ONCE VII MAF ASSUMES A DEFENSIVE POSTURE INSIDE THE CITY.

Class VI supplies are personal demand items including nonmilitary sales items. The USMC has not operated an exchange in a combat zone since 1952. USMC combatant forces have since been supported by US Army or Navy exchange services. Based on the Army assumption that a viable exchange service will not be operational until after D+59, VII MAF elements in the FBH will rely on items contained in the Ration Supplement Sundries Pack. This pack is authorized when feeding rations and exchange services are not available. Components of the package include tobacco, personal hygiene items, stationary, and general supplies. Each pack weighs 41 lb and is designed to accommodate the daily needs of 100 men. The individual share of .41 lb/man/day has been included with Class I for convenience.

On the assumption that AAFES is able to provide exchange services while the VII MAF defense of SYN City is ongoing, AAFES Contingency Plan 77-1 delineates inventory mixes while the AAFES Emergency Plan would give operating procedures and inventory materiel groupings. The table on the opposite page (Source: FM 101-10-1) shows the nine groupings and the lb/man/day resupply rate for each of the item groupings.

Supplementary food and drink items account for between 67% and 74%, depending on the local climate, of the total Class VI consumption rate. Civilian clothing, accounting for between 1.7% and 3% of the class total will be prohibited for wear during the overall defensive phase of the operation. Alcoholic beverage distribution will be tightly controlled based on the guidance of the CG, VII MAF. Additional purchases of military clothing by individuals would be reduced as essential clothing would be provided as a Class II supply. Estimated MOBA Class VI consumption rates are shown in the right-hand column of the opposite table.

There is no reason to assume that the US Army Class VI planning factors will not be applicable to the SYN City defense involving USMC personnel. Both consumption and distribution of Class VI supplies would decrease with increasing combat intensities. Class VI consumption is expected to be low after D+11 when all available resources are devoted to defensive preparations.

TABLE VII-8. CLASS VI DEMAND DURING SYN CITY DEFENSE

MATERIAL GROUP	CLIMATE			
	EUROPE TEMPERATE	SWA/PAC TROPIC	ARCTIC	URBAN DEFENSE
Tobacco	.139	.139	.139	.139
Food/Drink	2.375	4.750	2.371	2.250
Pers Hygiene	.168	.168	.168	.168
Mil Clothing	.097	.097	.097	.097
Jewelry (watch/wallets)	.004	.005	.004	.004
Stationary	.081	.083	.081	.081
Civilian Clothing	.096	.096	.096	NONE
Gen Supplies	.219	.219	.438	.219
Cameras, Film, Radios	<u>.028</u>	<u>.028</u>	<u>.028</u>	<u>.028</u>
Total Daily Consumption	3.207	5.585	3.520	2.986

NOTE: All consumption expressed in terms of lb/man/day.

## Logistic Planning Factors and Usage Rates

### CLASS VII - MAJOR EQUIPMENT ITEMS

MAJOR END ITEMS OF EQUIPMENT WILL EXPERIENCE CHANGES IN ATTRITION RATES AS A RESULT OF URBAN COMBAT. DATA ANALYSIS INDICATES THAT WHILE INDIVIDUAL ITEM USAGE MAY INCREASE OR DECREASE DEPENDING ON THE ITEM, THE OVERALL EFFECT OF URBAN COMBAT IS TO INCREASE MANY OF THE ESTABLISHED CARFs.

Class VII items include major equipment end items and final combinations of end products that are ready for their intended use. Class VII may be divided into the following subclasses:

Class VII(A) - Air	Class VII(K) - Tactical Vehicles
VII(B) - Ground Support Material	VII(L) - Missiles
VII(D) - Administrative Vehicles	VII(M) - Weapons
VII(G) - Electronics	VII(N) - Special Weapons

The focus of this section will be on ground-oriented Class VII items. Replacement factors for Classes VII(A), VII(L), and VII(N) are classified and would be expected to be very sensitive to the specific tactical operational concepts in Operation BREAKER. Class VII(D) administrative vehicles will not accompany the MAF into the FBH but may be utilized at theater support facilities.

Influences of urban combat on Class VII usage and replacement are many and varied. Daily usage times for selected equipment items may vary considerably from the norms given in TAM #6. Increased usage in a high-intensity environment would be expected to increase the equipment attrition rate and required replacement rate assuming no constraints on material availability. Many items of key equipment may be captured intact and used by friendly forces. Port MHE, firefighting equipment, heavy construction equipment, barges, lighters, and heavy wheeled logistic vehicles seized before sabotage or destruction efforts would supplement embarked MAF equipment and lower the replacement requirement but not necessarily the attrition rate. Seizure of utility facilities would reduce usage of generators, bath units, water purification equipment, and modular head units. Each urban area will have different characteristics and considerations that affect major equipment usage. Factors developed for a certain force structure in a particular environment should not be applied to other situations without extensive detailed analysis of differences between the two operations.

The SYN City physical environment and tactical concepts employed in Operation BREAKER SIX will serve to alter the utilization of many major equipment items. General trends for each subclass resulting from a defensive concept similar to Mission 6 are given in the figure opposite. "Outside SYN City" refers to GOP MCATF operations anticipated from D+11 through D+15.



- Class VII(A) - Decreased usage overall 7th MAW (Fwd) if airfields become untenable.
  - Outside SYN City - Heavy use fixed-wing and V/STOL support.
  - SYN City - Decreased use of all aviation assets.
- Class VII(B) - Greater than normal usage due to increased level of engineer support.
  - Outside SYN City - Low use bridging and engineer equipment.
  - SYN City - Increased use engineer equipment and rafting assets.
- Class VII(D) - Negligible usage in a combat zone.
  - Outside SYN City - Potential use at theater facilities. No use in MAF Security Zone.
  - SYN City - No use anticipated.
- Class VII(G) - Greater than normal usage, attrition, and replacement.
  - Outside SYN City - Conventional factors applicable.
  - SYN City - Increased use night vision devices, squad radios, wire communications equipment.
- Class VII(K) - Normal usage for logistic vehicles.
  - Outside SYN City - Greater than normal usage and attrition. MCATF operations.
  - SYN City - Significantly reduced mileage, increased vulnerability.
- Class VII(L) - Lower usage due to combined influences.
  - Outside SYN City - Conventional factors applicable to MCATF delaying operations.
  - SYN City - Low use due to line-of-sight and arming distance restrictions.
- Class VII(M) - Normal usage due to combined influences.
  - Outside SYN City - Heavy use vehicular-mounted weapons. Low use individual weapons.
  - SYN City - Increased use individual weapons. Lower than normal use tanks, LVTs.
- Class VII(N) - Lower than normal usage.
  - Outside SYN City - Potential for increased use to disrupt Aggressor attack formations.
  - SYN City - Low use due to presence of large civilian population.

Figure VII-5. Influences of Urban Defensive Combat on Class VII Subclasses

## Logistic Planning Factors and Usage Rates

### Class VII - Major Equipment Items (Continued)

Selected Class VII items have been analyzed to determine the impact of urban defensive operations. USMC CARFs (Combat Active Replacement Factors) given in TAM #6 are presented for purposes of comparison. A Delphi process involving six respondents familiar with the data base and proposed operational concepts generated the results shown in Table VII-9 opposite. Urban CARF recommendations are based on the utilization of these items in the overall SYN City defense as envisioned for Mission 6 - Defense Inside the City. Therefore, the CARFs include the influence, where applicable, of GOP MCATF operations as well as those defensive operations occurring within the FEBA. Planning factors for the overall operation must include influences from all operational environments likely to be encountered rather than the single, most visible environment.

The usage, attrition, and replacement requirements for each equipment item depended on several factors including the nature and purpose of the item itself, the location of that item within the defensive area, the physical nature of the defensive environment, and the possibilities for repair given effective salvage and maintenance operations. While trends in item utilization can be predicted with some degree of assurance for the general case of an urban defense, the determination of accurate CARFs becomes increasingly difficult as the nature of the operational environment becomes more generalized.

The following recommendations are submitted concerning the analysis of Class VII item utilization and replacement factors.

- TAM CARFs should be revised based on recent studies utilizing the US Army WARF methodology.
- Urban defensive CARFs are influenced significantly by the specific operational environment and defensive concept utilized. The urban defensive CARFs provided herein should be reviewed once an actual contingency arises and details concerning the environment and operations become known.
- Embarkation and resupply planning should be flexible enough to respond to short-notice requirements for additional replacement items beyond those quantities normally included in the mount-out.

TABLE VII-9. URBAN CARFs FOR SELECTED CLASS II ITEMS

## CLASS VII SELECTED ITEMS

NOMENCLATURE	TAMCN <sup>1</sup>	SUBCLASS <sup>2</sup>	TAM CARF <sup>1</sup>		URBAN CARF DEFENSE	
			EI	ES	MEAN	STD. DEV.
Air conditioner, 400 HZ 18K8TU	B0004	B	.0137	.0072	.0250	.0037
Bath unit, trl mtd	B0060	B	.0500	.0250	.0510	.0036
boat, bridge erection, 27'	B0110	B	.0612	.0215	.0625	.0044
bridge, fixed, 60T	B0140	B	.1584	.0792	.0932	.0119
bridge, float, M4T6	B0130	B	.1584	.0792	.1231	.0160
bridge, float, foot	B0150	B	.0310	.0158	.0165	.0019
Carrier, cgo, M116A1	D0050	K	.0800	.0400	.1237	.0088
Carrier, cgo, M733	D0055	K	.0800	.0400	.2560	.0144
Compressor, air 250 CFM, trl	B0390	B	NL	NL	.0850	.0068
Crane, RT, 30T	B0399	B	.0360	.0180	.1210	.0104
Crane, RT, 7T	B0445	B	.0518	.0275	.1162	.0113
Crane-shovel, cowl-mtd, 37-M55	B0400	B	.0600	.0300	.0165	.0014
Decon apparatus, M121A1	B0465	B	.0715	.0415	.2372	.0164
Detect set, mine, AN/PRS-7(B)	B0473	G	.2365	.1147	.1986	.0111
Detect set, mine, AN/PSS-11(imp)	B0475	G	.1578	.0789	.1740	.0158
Detect set, seismic, AN/PSR-1A	A0490	G	.1000	.0500	.2317	.0175
DML, MRA-301	A0545	G	.0600	.0300	.0300	.0035
TAFDS, M1966	B0675	B	.0082	.0037	.0798	.0034
AAFS, M69HC	B0685	B	.0082	.0037	.0925	.0046
Generator, 3KW60, MEP-016A	B0730	B	.0504	.0261	.0620	.0052
Generator, 10KW60, MEP-0F A	B0891	B	.0226	.0116	.0577	.0038
Generator, 30KW60, MEP-114A	B0971	B	.1000	.0500	.0712	.0025
Generator, 100KW60, MEP-007A	B1045	B	.1000	.0500	.0765	.0027
Grader, road, motorized, hvy	B1081	B	.0850	.0425	.0723	.0039
Heliport light set	A0815	G	.0200	.0100	.0462	.0034
HERS	B1135	B	.0082	.0037	.0441	.0039
Howitzer, SP, 8" M110A2	E0692	M	.1021	.0471	.1337	.0044
Howitzer, T, 105mm, M101A1	E0640	M	.0600	.0300	.0985	.0044
Howitzer, SP, 155mm, M109A3	E0663	M	.1335	.0632	.1658	.0044
Howitzer, T, 155mm, XM198	E0670	M	.0400	.0200	.0675	.0033
Ice cream plant, M33	B1160	B	NL	NL	.0450	.0033
Landing veh, FT, LVTC7	E0795	K	.1600	.0800	.1600	.0074
Landing veh, FT, LVTP7	E0845	K	.1600	.0800	.1620	.0046
Landing veh, FT, LVTR7	E0855	K	.1600	.0800	.2231	.0176
Launcher, rkt, M202A1	E0900	M	.4211	.1876	.3317	.0293
Launcher, TOW, M220AE1	E0935	B	.2868	.1130	.2520	.0151
Mixer, concrete, 16S-2A	B1325	B	NL	NL	.0894	.0054
MPGS	E1041	B	NL	NL	.2560	.0152
Mortar, 81mm, M29E1	E1090	M	.2837	.1349	.4255	.0550
Mortar, 60mm, M19 (XM244)	E1060	M	.2340	.1170	.4117	.0117
Night vision sight, crew svd	E1159	G	.2825	.1303	.4237	.0307
Radio set, AN/GRA-39A control	A1730	G	.0800	.0400	.1950	.0115
Radio set, AN/VRC-47	A2150	G	.1570	.0736	.1520	.0056
Recovery veh, M88A1	E1377	K	.0440	.0222	.1458	.0087
Refrigerator, prefab, 63UCF	B1700	B	.0100	.0042	.0125	.0026
Roller, pneu tire	B1790	B	NL	NL	.0100	.0015
Saw, chain, port	B1830	B	NL	NL	.0765	.0030
Saw, radial, woodworking	B1840	B	.0600	.0300	.0153	.0010
Scraper, towed	B1920	B	.0273	.0166	.0132	.0010
Semi-trl, fuel, 5000G	D0215	K	.0200	.0100	.0567	.0079
Semi-trl, low bed, 40T	D0235	K	.0200	.0100	.0225	.0033
Semi-trl, 65T, M793	D0200	K	NL	NL	.0183	.0021
Switchboard, SB-22/PT	A2480	G	.0660	.0330	.0814	.0088
Tank, combat, M60A1	E1875	M	.3902	.1151	.3970	.0320
Tank, combat, M60A1 W/M9	E1876	M	.3902	.1151	.4013	.0144
Tank, fabric, collaps, 3000G	B2130	B	.0312	.0182	.0916	.0036
Tractor, MC450	B2444	B	.1000	.0500	.1000	.0076
Tractor, MC1150, MP buck	B2463	B	.1447	.0673	.1315	.0046
Tractor, Terex 82-30FM-M3	B2467	H	.0316	.0161	.0791	.0042
Tractor, Terex 72-31MP	B2465	H	.0600	.0300	.0836	.0047
Tractor, util, GSE, MF40	B2464	B	NL	NL	.0563	.0066
Trailer, water, M148A1	D0880	K	.0618	.0279	.0775	.0041
Trailer, cgo, 1 1/2T	D0860	K	.0618	.0279	.0391	.0015
Truck, util, 1/4T, M151A2	D1160	K	.0748	.0491	.0982	.0079
Truck, plat, 1/2T, M274A5	D1100	K	.0500	.0250	.1771	.0040
Truck, cgo, 2 1/2T M35A2C	D1030	K	.0400	.0200	.1226	.0066
Truck, forklift, 6000 lb., RT	B2560	B	.0600	.0300	.1279	.0040
Truck, tank, fuel, M49A2C	D1100	K	.0400	.0200	.1513	.0049
Truck, tractor, 5T, M52A2	D1130	K	.0400	.0200	.0711	.0031
Water, purif equip, 1500 6PH	B2605	B	.0500	.0250	.0757	.0034

Note 1 - From NAVMC 1017 - TAM Revision #6, 25 Nov 80

2 - Subclass commodity designator, all items Type 1 material

B - Ground support K - Tactical vehicles E - General Supplies F - Industrial Supplies

G - Electronics M - Weapons F - Clothing &amp; textiles

## Logistic Planning Factors and Usage Rates

### CLASS VIII - MEDICAL SUPPLIES

PROLONGED DEFENSIVE OPERATIONS IN AN URBAN ENVIRONMENT MAY PRODUCE CASUALTY LEVELS IN EXCESS OF THOSE SUPPORTABLE BY THE CURRENT LEVEL OF CLASS VIII MOUNT-OUT. MOUNT-OUT AUGMENTATION BLOCKS SHOULD BE PREPOSITIONED AT THEATER SUPPORT FACILITIES FOR EMERGENCY DELIVERY INTO THE FBH.

#### General

The level of medical supplies required to support a military force in a given combat situation is highly dependent upon Threat weapons effectiveness, combat intensity, tactical and strategic decisions concerning the employment of NBC warfare, and the overall concept of medical support within the area of operation. The SYN City defensive scenario involves a moderate-to-heavy combat intensity and the employment of state-of-the-art modern weaponry with all initial medical treatment being accomplished within the FBH or at CRTSs in the Sea Echelon. The following discussion is based on the level of medical supplies required during the D+11 to D+40 defensive period as well as those medical supplies consumed during offensive operations.

MCO 6700, dated 22 June 1981, is the current reference detailing mount-out quantities of medical supplies and equipment. The quantities of AMALs/ADALs included in the mount-out are structured to support the treatment of 20,000 casualties in a 60-day period. These quantities are shown in Volume I, Tables VII-8 and VII-9. The current Class VIII planning factor of 1.53 lb/man/day includes both equipment and consumables.

#### SYN City Defensive Requirements

The table opposite shows the level of casualties anticipated during the course of the SYN City offensive and defensive actions. Assuming that the treatment of each casualty requires an equal amount of Class VIII consumables then the overall depletion rate of the Class VIII mount-out averages to 1.895% per day. At this rate the 60-day mount-out of medical consumables would be exhausted by D+52. Additional quantities of medical consumables should be delivered into the FBH NLT D+40.

The establishment of a defensive posture in an urban area affects Class VIII requirements in several ways. The availability of indigenous structures suitable for medical purposes will provide additional protection for medical activities and serve to decrease the loss of equipment and on-position supplies as a result of hostile action. An increased incidence of casualties with concussion or masonry-fragment-type injuries should be expected. The level of venereal disease would increase if no-fraternization policies were not strictly enforced. Personnel may be subject to additional smoke inhalation and burn injuries if forced to defend in areas

with conflagrant structures. The temperate climatic conditions expected during the SYN City defense should eliminate cold-weather injuries but increase heat injuries if personnel are forced to wear chemical protective clothing for extended periods.

#### Summary

The 60-day level of medical supplies accompanying VII MAF/Landing Force is sufficient to treat a moderate-to-heavy level of casualties through D+52. Medical resupplies should be delivered into SYN City NLT D+40. Medical support requirements during the SYN City defense are not dissimilar enough to those in a conventional combat operation to warrant reconfiguring AMALs/ADALs. Although the urban environment may slightly alter the composition or mix of injuries, urban casualties are much the same as nonurban casualties. No new medical procedures or associated medical supplies need be developed to treat casualties in an urban environment. The MAF should be self-reliant in terms of medical support and medical supplies as most, if not all, indigenous medical capabilities will be required to treat civilian casualties. Indeed, some medical augmentation of indigenous medical supplies by VII MAF may be required and/or appropriate. (See data on CA.)

TABLE VII-10. CLASS VIII CONSUMABLE REQUIREMENTS

<u>PERIOD</u>	<u>CASUALTIES</u> <sup>1</sup>	<u>% MOUNT-OUT REQUIRED</u> <sup>2</sup>	<u>% MOUNT-OUT REMAINING</u>
I (D-5 to D-1)	1,663	NONE <sup>3</sup>	100.0
II (D-day)	887	4.4	95.6
III (D+1 to D+5)	1,359	6.8	88.8
IV (D+4 to D+6)	1,024	5.1	83.7
V (D+7 to D+10)	977	4.9	78.8
VI (D+11 to D+15)	1,417	7.1	71.7
VII (D+16 to D+40)	9,870	49.4	22.3

Note 1 - Includes both battle and nonbattle casualties

2 - Equals # casualties divided by 20,000

3 - Treated with medical supplies carried aboard ATF shipping

## Logistic Planning Factors and Usage Rates

### CLASS IX - REPAIR PARTS

DEFENSIVE COMBAT WHOLLY CONTAINED WITHIN AN URBAN ENVIRONMENT IS EXPECTED TO REDUCE THE OVERALL CLASS IX REQUIREMENT BY 5%. REPAIR PART REQUIREMENTS FOR EACH EQUIPMENT ITEM SHOULD BE ANALYZED IN RELATION TO THE UTILIZATION OF THAT ITEM IN AN URBAN DEFENSE.

#### General

Class IX requirements are probably the most difficult consumable requirements to estimate due to the large number of individual Class IX items, the lack of urban combat experience with these items, and continuing modernization and improvement programs involving major end items. Many equipment items are largely maintained by civilian vendors and repair parts requirements have not been captured in USMC data bases. Other items are nearing the end of their useful service life and are not being repaired when found unservicable. Many items of engineer and motor transport equipment are in this category and repairs are not cost-effective beyond a certain point. Replacement items have not been in service long enough to accumulate historical data concerning Class IX requirements.

A number of factors may influence or even cause the replacement of individual parts or assemblies. Some of these factors include:

- |                         |                          |
|-------------------------|--------------------------|
| • Climate               | • Indirect combat action |
| • Mechanical ineptitude | • Manufacturing defects  |
| • Normal wear and tear  | • Pilferage              |
| • Direct combat action  | • Intentional misuse     |

The only factors noted above that are directly dependent on the operational environment are climate, combat action, and possibly pilferage. The other factors are more dependent upon technical competence and material durability.

#### SYN City Defensive Requirements

The resupply rate for spare parts during an urban defense will be influenced by the usage of vehicles, weapons, and equipment that are found to have utility in that situation. Considerations noted below assume that the MAF Security Zone will be penetrated in force and that the bulk of 7th MAW (Fwd) will be redeployed once Aggressor units close on the FEBA.

- Class IX(A) - Lower requirement within FBH due to decreased number of squadrons. Normal requirement for those V/STOL assets remaining in SYN City.

- Class IX(B) - Increased requirement due to heavy use of engineer equipment operating in Forward Defense Area.
- Class IX(D) - Negligible requirement within FBH. Administrative vehicles will not be deployed into SYN City.
- Class IX(G) - Increased requirement due to heavy use of night vision devices and other electronic detection equipment.
- Class IX(K) - Lower demand due to decreased overall use within a confined area. Tires will be a high demand item.
- Class IX(L) - Lower demand due to unsuitability of selected missiles in a close-quarters environment.
- Class IX(M) - Increased requirement overall due to significant increase in utility of individual and light crew-served weapons.
- Class IX(N) - Lower requirement due to unsuitability of such weapons in a populated area.
- Class IX(T) - Increased requirement due to increase in facilities maintenance tasks, greater use of hoisting devices, and civilian pilferage.

The table below provides estimated resupply factors, in terms of lb/man/day, once VII MAF has consolidated its defenses inside the FEBA.

TABLE VII-11. SYN CITY DEFENSE CLASS IX RESUPPLY FACTORS

<u>SUBCLASS</u>	<u>CURRENT<sup>1</sup></u>	<u>SYN CITY DEFENSE<sup>2</sup></u>
IX(A) - AVIATION	.200	.067
IX(B) - GROUND SUPPORT MATERIEL	.260	.325
IX(D) - ADMINISTRATIVE VEHICLES	.010	.001
IX(G) - ELECTRONICS	.090	.120
IX(K) - TACTICAL VEHICLES	.780	.663
IX(L) - MISSILES	.020	.013
IX(M) - WEAPONS	.520	.598
IX(N) - SPECIAL WEAPONS	.010	.008 <sub>3j</sub>
IX(T) - INDUSTRIAL SUPPLIES	.010	.013
	1.900	1.808

Note 1 - Current planning factors contained in JSCP.

2 - Based on modified Delphi technique; applicable to those units within FBH subsequent to D+16.

3j - This factor would increase markedly if NCA authorizes the use of special weapons.

## Logistic Planning Factors and Usage Rates

### CLASS X - NONMILITARY PROGRAMS

THE ISOLATION OF AN URGAN AREA AND ITS OCCUPANTS WILL LIKELY PREVENT THE RESUPPLY OF SUBSISTENCE ITEMS TO INCLUDE FOOD AND EMERGENCY MEDICAL SUPPLIES. VII MAF MUST BE PREPARED TO PROVIDE THESE ITEMS TO MINIMIZE UNDUE ADVERSE IMPACTS ON THE POPULACE AND COMPLY WITH BASIC HUMANITARIAN CONSIDERATIONS.

A major objective during the amphibious assault into SYN City was the isolation of that area from Aggressor combat units. However, the isolation of the city has an adverse impact on VII MAF in that nonmilitary supplies are prevented from entering the city, even if the Aggressor government chose to permit their continued movement. By isolating SYN City, VII MAF is bound by principles of international law and humanitarian considerations to provide a subsistence level of support to those elements of the populace denied external (Aggressor-originated) resupplies.

The SYN City data base does not provide detailed information concerning the type or level of subsistence-oriented items stocked within SYN City before the initiation of Operation BREAKER. It was assumed during the offensive analysis that ten days of subsistence supplies were extant within stores, warehouses, and distribution centers; appropriate agencies and elements were tasked to provide and distribute a total of 128 ST per day of subsistence food items. It was also recommended that two emergency drug kits and one equipment kit be assembled and staged at the theater support facility in the event that indigenous Class VIII stocks proved insufficient. (See Volume I, Table V-10, and Volume II, Annex G and Tab B to Appendix 3 to Annex G.)

The Class X situation during the defense of SYN City is essentially the same as at the end of the offensive phase. Indigenous food stocks are near exhausted and the populace is relying on VII MAF for delivery and distribution of a subsistence level of food. The defensive scheme requires the relocation of several food distribution points, as shown in Figure V-4, but the overall tonnage requirement remains the same at 128 short tons per day. (See Volume III, pg. 40-41 and Volume IV, Annex G.)



CHAPTER VIII  
SYNTHETIC CITY (SYN CITY) TECHNICAL DATA BASE

## Synthetic City (SYN City) Technical Data Base

### EVALUATION

THE SYN CITY DATA BASE, DEVELOPED FOR NCEL UNDER CONTRACT N68305-80-C-0037, PROVED TO BE EXTREMELY USEFUL DURING THE ANALYSIS OF URBAN DEFENSIVE LOGISTICS. THIS SECTION NOTES THOSE DATA ELEMENTS FOUND USEFUL AND RECOMMENDS ADDITIONAL ELEMENTS FOR INCORPORATION INTO THE DATA BASE.

The SYN City Technical Data Base was evaluated during the course of Phase I (Offense) of this study effort (Volume I Chapter VIII) and found to be an adequate technological base from which to address many logistic concepts and systems. Phase II (Defense) is a logical continuation of Phase I and many aspects of the previous evaluation are still applicable. The data base generally contains more information than necessary for the preparation of MAF-level operation plans. Data provided in many categories far exceeded that normally available for contingency planning. Contingency planning data, on the other hand, may also provide additional and/or refined data not extant in the technological base. In either case, the type and level of information available will influence many aspects of detailed tactical and support planning.

The figure opposite summarizes utilization of the SYN City Technical Data Base during the Phase II analysis and notes other data that would expand the usefulness of existing data base. All categories of data were utilized to some extent; most categories provided data both sufficient for detailed analyses and in excess of that normally contained in contingency data packages. Data noted as lacking in several categories might be available prior to the operation, while other data would not be available until after consolidation of the urban area. It is recommended that those additional data types noted as desirable be considered for future development and incorporation into the technical data base.

The most notable data shortfalls, from the standpoint of detailed tactical and logistic analysis, can be grouped into three categories:

- Natural Features - Trafficability parameters, microrelief;
- Man-Made Features - Building types, density, construction materials; and
- Ethnological Features - Socio-Political tendencies, hostility factor.

The data base does not contain trafficability data for most areas within the MAF tactical area of responsibility, with the exception of two mountain ranges and an extensive swamp. Additional data in the form of individual overlays for vegetation (type, size, canopy closure), microrelief, and soil type (or a composite trafficability overlay) would facilitate the selection

of Aggressor approach routes and the estimation of Security Zone barrier requirements. The technical data base adequately delineates urban, suburban, and industrial areas within the city but provides little additional information concerning the type or spacial arrangement of structures. Defensive organizations and deployments as well as Class V expenditures are significantly influenced by the military usefulness of the urban terrain (structures and intervening open areas) that must be defended. The final type of desirable data, and potentially most critical to the overall operation, concerns the anticipated actions by the indigenous populace in response to the MAF presence. Military police and civil affairs augmentation requirements could become unmanageable with fanatical popular opposition; internal security requirements would militate in favor of minimizing the MAF presence inside the city by selecting appropriate offensive or defensive concepts (Seize A Corridor/Defense Outside the City).

It is recommended that the data shortfalls noted above be resolved by the development of supplemental data either in a generalized format or directly from contingency data packages. This data will materially enhance the usefulness of the technological base. Other desirable data is not as crucial in terms of the overall analysis, but is necessary to complete the data base and allow for fully integrated and detailed combat, combat support, and combat service support planning. The utility of the model lies in its versatility--major additions or changes to the existing data can be made on a case-by-case basis.

DATA ELEMENT	DATA UTILIZATION				TYPE DATA DESIRABLE*
	DATA UTILIZED	NECESSARY DATA PRESENT	ADDITIONAL DATA DESIRABLE		
I.A. Urban Space/Steep Slope					Not Evaluated
I.B. Urban Space/Shallow Slope	X		X		Vegetation/Trafficability Data
II.A. Urban Environment	X	X			
III.A. Urban Comm-Garbage	X		X		Equipment Data
III.B. Urban Comm-Sewerage	X	X			Engineering Data
III.C. Urban Comm-Storm Water Disposal	X	X	X		Engineering Data
III.D. Urban Comm-Potable Water	X		X		Storage Capacities and Well Production Data
III.E. Urban Comm-Electricity	X	X	X		Standby Generating Capacity
III.F. Urban Comm-Telephone	X	X			
III.G. Urban Comm-Radio/Television	X	X			
III.H. Urban Comm-Minor Radio	X	X			
IV.A. Transportation-General	X	X	X		Vegetation/Trafficability Data
IV.B. Trans-Surface Network	X	X	X		Additional Road and Bridge Data
IV.C. Trans-Water Routes	X	X	X		More Detailed Hydric Data
IV.D. Trans-Rail Routes	X		X		Equipment Data
IV.E. Trans-Air	X	X	X		Additional Facilities Data
V.A-D. Medical	X	X	X		Level of Supply Stocks
VI.A. Resources-Local Transportation	X		X		Additional Equipment Data
VI.B. Resources-Construction	X		X		Material Type and Quantity Data
VI.C. Resources-Industry	X	X			
VI.D. Resources-Funds	X		X		Expenditure and Funding Allocation Data
VI.E. Resources-Fuels	X	X	X		Task Priority Data
VI.F. Resources-Public Buildings	X	X			Quantity of Firefighting Equipment
VI.G. Resources-Open Areas, Buildings	X		X		Structural Capacity and Construction Data
VI.H. Resources-People	X		X		Demographic Data

Figure VIII-1. Summary of Data Base Utilization, Presentation, and Completion

APPENDIX A  
BULK FUEL ANALYSIS

## Bulk Fuel Analysis

### INTRODUCTION

THIS APPENDIX PROVIDES SUPPORTIVE DATA FOR THE QUANTITATIVE ANALYSIS OF BULK FUEL REQUIREMENTS SUMMARIZED IN CHAPTER VII--CLASS III (W). WHILE THE BASIC METHODOLOGY EMPLOYED BY BDM ANALYSTS WOULD BE VALID FOR ANY COMBAT SITUATION, THE DATA CONTAINED HEREIN IS BASED ON VII MAF CONDUCTING DEFENSIVE OPERATIONS SIMILAR TO MISSION 6 - DEFENSE INSIDE THE CITY.

Bulk fuel requirements during an urban defense are influenced significantly by the defensive posture adopted within the city and the extent of combat operations outside the city. Chapter III provides details concerning the tactical concepts envisioned for Mission 6. MCATF operations are assumed to a viable option until late on D+15 when the GOP forces are forced to withdraw inside the FEBA. Given the complexity of combat operations and defensive preparations from D+11 through D+15 and the nature of a relatively static defense subsequent to D+15, BDM analysts were concerned that the existing USMC Class III (W) estimation procedures might not be sufficiently sensitive to accurately predict the impact of urban defensive operations.

The methodology employed to achieve the desired level of sensitivity is discussed in Chapter VII-Class III (POL) and is not repeated here. Data presented in the bulk fuel section of Chapter VII reflects a much condensed version of the detailed data which follows this introduction. Overall consumption and storage requirements are given in sections of Chapters V and VII while consumption by equipment category is provided herein.

Supportive data in this appendix include:

- Printout of computer program (BASIC) used to generate data.
- Fuel consumption quantities and comparisons (BDM vs TAM) by major unit, tactical area of responsibility, and defensive period.
  - Suppressed Format - Category by category comparisons have been omitted. Only area totals are given.
  - Expanded Format - Includes consumption comparisons for 23 identified equipment categories as well as area totals.
- An excursion into the impact of dieselization of light wheeled vehicles (11/4T) and marginal terrain vehicles expected to occur by the end of the mid-range period. (Consumption listed as "MID-RANGE IMPACT".)
- A determination of the total demand, per period, on fuel storage facilities and associated throughput systems.

```

1 DATA 2,3,5,2,8,2,3,5,0,8,1,2,5,1
4 DATA 1,92,0,100,1,0,68,0,125,1,1,0,150,1,1,25,0,100,1
7 DATA 0,45,0,45,1,0,4,0,30,1,0,125,0,42,64,1,0,08,0,32,1
10 DATA 0,2,0,37,2,0,0,08,0,16,4,3,0,04,0,12,0
13 DATA 3,48,48,1,3,60,60,1,0,60,60,1,0,96,96,1
16 DATA 0,18,18,0,0,100,100,1,0,700,700,1,0,52,5,52,5,0
19 DATA 3,15,15,0,0,18,18,1,0,125,0,31,96,1,0,32,32,1
22 DIM A(23),E(23,7),I1(3,3)
25 READ I1
28 M4=0
31 A$="N"
34 T1=0.77
37 T2=0.31
40 M5=0
43 M6=0
46 M7=0
49 D5=0
52 D6=0
55 D7=0
58 D8=0
61 RESTORE 4
64 FOR I=1 TO 23
67 PRINT USING "FA,2D","INPUT QUANTITY#";I;
70 INPUT B(I)
73 NEXT I
76 E=0
79 PRINT "ENTER RADIUS OF ACTION=";
82 INPUT R
85 PRINT "ENTER RESUPPLY DISTANCE=";
88 INPUT D
91 PRINT "ENTER NUMBER OF DAYS FOR THIS CALCULATION=";
94 INPUT Y
97 PRINT "ENTER AREA UNDER CONSIDERATION (1=MCATE,2=SYN CITY)";
100 INPUT S9
103 GO TO 59 OF 106,112
106 Z$="MCATE"
109 GO TO 115
112 Z$="SYN CITY"
115 PRINT "ENTER PERIOD UNDER CONSIDERATION (ROMAN NUMERALS)";
118 INPUT X$
121 PRI "DO YOU WISH NUMERIC PRINTOUT SUPPRESSION(SUB-TOTALS) OR NO";
124 INPUT S$
127 PRINT 037,25,1
130 PRINT 051,11,1
133 IF A$="Y" THEN 142
136 PRINT 051 USING "/,30X,FA" "FUEL USAGE COMPARISON - CLASS III(KN)"
139 PRINT 051 USING "FA,FA" "PERIOD: ";X$
142 PRINT 051 USING "/,FA,FA" "LOCATION: ";Z$
145 PRINT 051 USING "FA,3D,2D,FA" "RADIUS OF ACTION= ";R;" KILOMETERS"
148 PRINT 051 USING "FA,3D,2D,FA" "RESUPPLY DISTANCE= ";D;" KILOMETERS"
151 PRINT 051 USING "FA,2D,FA,/" "LENGTH OF PERIOD= ";Y;" DAYS"
154 PRINT 051 USING 157;"SYSTEM";"QUANTITY";"CALC."; "TAM";"RATIO"
157 IMP2X,FA,2X,FA,6X,FA,12X,FA,12X,FA,12X;"CALC.";9X;"TAM";14X;"RATIO"
160 PRI 051;USI 162;"1,0."; "IN AREA";"CONSUMPTION";"CONSUMPTION";"OF"

```

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163 IMAGE 4% FR 2% FR 4% FR 5% FR 9% FR 9% "CONSUMPTION", 6%, 5
166 PRINT @51 "CONSUMPTION      OF"
169 PRINT @51 USING 172 " (MOGAS)", " (MOGAS)", "CALC/TAM"
172 IMAGE24% FR 8% FR 8% FR 8% " (DIESEL)", 7% " (DIESEL)", 8% "CALC. TAM", /
175 R$="CONSUMPTION TOTALS="
178 F=0
181 M1=0
184 M2=0
187 D2=0
190 D3=0
193 FOR I=1 TO 23
196 READ E(I,1),E(I,2),E(I,3),E(I,7)
199 IF S9=1 OR I>2 THEN 214
202 GO TO 1 OF 205,211
205 E(I,1)=T1
208 GO TO 214
211 E(I,1)=T2
214 IF F=0 THEN 229
217 IF I<9 OR I>11 THEN 229
220 E(I,7)=1
223 E(I,7)=1
226 E(I,7)=1
229 IF I=22 THEN 280
232 IF I>11 THEN 301
235 GO TO 1 OF 220, 244, 250, 250, 250, 256, 262, 268, 274, 268, 268
238 D1=4*R
241 GO TO 283
244 D1=5.2*R
247 GO TO 283
250 D1=36*O/(2*O/10+4)
253 GO TO 283
256 D1=2*R
259 GO TO 283
262 D1=36*O/(2*O/15+0.67)
265 GO TO 283
268 D1=36*R/(2*R/15+0.5)
271 GO TO 283
274 D1=36*R/(2*R/15+0.67)
277 GO TO 283
280 D1=21.6*O/(2*O/15+1)
283 IF I/2 THEN 292
286 E(I,2)=D1*(E(I,1)+I1(I,S9)*I1(I,3))
289 GO TO 301
292 E(I,2)=D1*(E(I,1))
295 IF I<6 THEN 301
298 E(I,2)=E(I,2)+I1(3,S9)*I1(3,3)
301 E I 4 :=E(I,2)+Q(I)
304 E(I,5)=E(I,3)*Q(I)
307 IF E(I,5)=0 THEN 313
310 E(I,6)=E(I,4)/E(I,5)
313 IF E(I,7)<0 THEN 324
316 M1=M1+E(I,4)
319 M2=M2+E(I,5)
322 IF S$="Y" THEN 346

```

```

325 PRINT #51: USING 328: I, Q(I), E(I, 4), E(I, 5), E(I, 6), 3, 0, 0
328 IMAGE 3A, 2D, 4X, 4D, 6, 8X, 5D, 2D)
331 GO TO 346
334 D2=D2+E(I, 4)
337 D3=D3+E(I, 5)
340 IF S$="Y" THEN 346
343 PRINT #51: USING 328: I, Q(I), 0, 0, 0, E(I, 4), E(I, 5), E(I, 6)
346 NEXT I
349 M3=M1/M2
352 D4=D2/D3
355 PRINT #51: USING 358: R$, M1*1.15, M2*1.15, M3, D2*1.15, D3*1.15, D4
358 IMAGE /, FA, 2X, 7D, 2D, 6X, 7D, 2D, 5X, 6D, 2D, 5X, 6D, 2D, 5X, 6D, 2D
361 PRINT #51: USING 364: Y, Y*M1*1.15, Y*M2*1.15, Y*D2*1.15, Y*D3*1.15
364 IMAGE "FOR ", 2D, " DAYS, TOTALS= ", 2X, 2(7D, 2D, 6X), 16X, 2(8D, 2D, 5X)
367 IF F=1 THEN 397
370 M4=M4*M1*Y
373 M5=M5*M2*Y
376 S$="Y"
379 D5=D5+D2*Y
382 D6=D6+D3*Y
385 RESTORE 4
388 R$="MID-RANGE IMPACT = "
391 F=1
394 GO TO 181
397 CALL "WRIT", 15
400 F=0
403 S$="N"
406 PRINT #37, 26, 0
409 M6=M6*M1*Y
412 M7=M7*M2*Y
415 D7=D7+D2*Y
418 D8=D8+D3*Y
421 PRINT "DO YOU HAVE ADDITIONAL AREAS TO CALCULATE(Y OR N)?"
424 INPUT A$
427 IF A$="N" THEN 433
430 GO TO 61
433 PRINT #37, 26, 1
436 PRINT #51, 11, 1
439 PRINT #51: USING "///, 38X, FA": "SUPPORTING STORAGE AREA DEMAND"
442 M4=M4*1.15
445 M5=M5*1.15
448 D5=D5*1.15
451 D6=D6*1.15
454 M6=M6*1.15
457 M7=M7*1.15
460 D7=D7*1.15
463 D8=D8*1.15
466 PRINT #51: USING 358: "CONSUMPTION TOTAL=", M4, M5, M4/M5, D5, D6, D5/D6
469 PRINT #51: USING 358: "MID-RANGE IMPACT= ", M6, M7, M6/M7, D7, D8, D7/D8
472 PRINT #37, 26, 0
475 PRINT #51, 11, 0
478 STOP
481 END

```



# FUEL USAGE COMPARISON - CLASS III(W)

PERIOD: VI

LOCATION: MCATE

RADIUS OF ACTION= 20.00 KILOMETERS

RESUPPLY DISTANCE= 40.00 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

SYSTEM I.D.	QUANTITY IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
1	140	0.00	0.00	0.00	22280.00	14000.00	1.59
2	110	0.00	0.00	0.00	7955.20	15750.00	0.51
3	2	0.00	0.00	0.00	240.00	300.00	0.80
4	10	0.00	0.00	0.00	1500.00	1000.00	1.50
5	5	0.00	0.00	0.00	270.00	225.00	1.20
6	24	0.00	0.00	0.00	400.00	720.00	0.56
7	100	0.00	0.00	0.00	3238.20	4605.12	0.70
8	32	0.00	0.00	0.00	582.06	1024.00	0.57
9	20	963.14	744.00	1.16	0.00	0.00	0.00
10	14	254.65	229.60	1.11	0.00	0.00	0.00
11	206	1873.52	2472.00	0.76	0.00	0.00	0.00
12	24	0.00	0.00	0.00	1152.00	1152.00	1.00
13	60	0.00	0.00	0.00	3600.00	3600.00	1.00
14	26	0.00	0.00	0.00	1560.00	1560.00	1.00
15	2	0.00	0.00	0.00	192.00	192.00	1.00
16	8	144.00	144.00	1.00	0.00	0.00	0.00
17	0	0.00	0.00	0.00	0.00	0.00	0.00
18	0	0.00	0.00	0.00	0.00	0.00	0.00
19	0	0.00	0.00	0.00	0.00	0.00	0.00
20	2	30.00	30.00	1.00	0.00	0.00	0.00
21	0	0.00	0.00	0.00	0.00	0.00	0.00
22	32	0.00	0.00	0.00	545.68	1024.00	0.53
23	4	0.00	0.00	0.00	120.00	120.00	1.00
CONSUMPTION TOTALS=		3640.10	4162.54	0.87	50200.02	49771.40	1.01
FOR 5 DAYS, TOTALS=		18200.51	20812.70		251040.10	248857.01	
MID-RANGE IMPACT =		200.10	200.10	1.00	53646.02	53733.84	1.00
FOR 5 DAYS, TOTALS=		1000.50	1000.50		268240.11	268669.21	

LOCATION: SYN CITY

RADIUS OF ACTION= 2.40 KILOMETERS

RESUPPLY DISTANCE= 4.10 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

SYSTEM I.D.	QUANTITY IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
1	0	0.00	0.00	0.00	0.00	0.00	0.00
2	92	0.00	0.00	0.00	613.53	11500.00	0.01
3	6	0.00	0.00	0.00	183.70	300.00	0.20
4	3	0.00	0.00	0.00	114.63	300.00	0.11
5	0	0.00	0.00	0.00	0.00	0.00	0.00
6	0	0.00	0.00	0.00	0.00	0.00	0.00
7	573	0.00	0.00	0.00	8689.19	24422.72	0.16
8	40	0.00	0.00	0.00	337.17	1200.00	0.28
9	13	226.91	483.60	0.47	0.00	0.00	0.00
10	77	649.05	1262.00	0.51	0.00	0.00	0.00
11	342	1441.40	4104.00	0.35	0.00	0.00	0.00
12	169	0.00	0.00	0.00	8112.00	8112.00	1.00
13	840	0.00	0.00	0.00	50400.00	50400.00	1.00
14	216	0.00	0.00	0.00	12960.00	12960.00	1.00
15	49	0.00	0.00	0.00	4704.00	4704.00	1.00
16	63	1134.00	1134.00	1.00	0.00	0.00	0.00
17	57	0.00	0.00	0.00	9120.00	9120.00	1.00
18	12	0.00	0.00	0.00	8400.00	8400.00	1.00
19	16	940.00	840.00	1.00	0.00	0.00	0.00
20	7	105.00	105.00	1.00	0.00	0.00	0.00
21	69	0.00	0.00	0.00	1242.00	1242.00	1.00
22	84	0.00	0.00	0.00	681.22	2686.32	0.22
23	65	0.00	0.00	0.00	2000.00	2000.00	1.00
CONSUMPTION TOTALS=		5055.82	9118.81	0.55	123691.33	158824.60	0.78
FOR 5 DAYS, TOTALS=		25279.11	45594.05		618456.64	794172.98	
MID-RANGE IMPACT =		2390.35	2390.35	1.00	126356.30	165562.56	0.76
FOR 5 DAYS, TOTALS=		11954.25	11954.25		631781.50	827812.78	

# SUPPORTING STORAGE AREA DEMAND

CONSUMPTION TOTAL=	42479.62	66406.75	0.65	869496.74	1043029.99	0.81
MID-RANGE IMPACT=	12954.75	12954.75	1.00	900021.61	1096481.99	0.82

# FUEL USAGE COMPARISON - CLASS III (C)

PERIOD VI

LOCATION: MORTF

RADIUS OF ACTION= 20.00 KILOMETERS

RESUPPLY DISTANCE= 40.00 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

SYSTEM QUANTITY I.D. IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
CONSUMPTION TOTALS=	3640.10	4162.54	0.87	50208.02	45771.40	1.09
FOR 5 DAYS, TOTALS=	18200.51	20812.70		251040.10	248857.01	
MID-RANGE IMPACT =	200.10	200.10	1.00	53648.02	53733.04	1.00
FOR 5 DAYS, TOTALS=	1000.50	1000.50		268240.11	268669.21	

LOCATION: SYN CITY

RADIUS OF ACTION= 2.40 KILOMETERS

RESUPPLY DISTANCE= 4.10 KILOMETERS

LENGTH OF PERIOD= 5 DAYS

SYSTEM QUANTITY I.D. IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
CONSUMPTION TOTALS=	5055.82	9118.81	0.55	123691.33	153834.60	0.78
FOR 5 DAYS, TOTALS=	25279.11	45594.05		618456.64	794172.98	
MID-RANGE IMPACT =	2390.85	2390.85	1.00	126356.30	165562.56	0.76
FOR 5 DAYS, TOTALS=	11954.25	11954.25		631781.50	827812.78	

## SUPPORTING STORAGE AREA DEMAND

CONSUMPTION TOTAL=	42479.62	66406.75	0.65	869496.74	1043029.99	0.82
MID-RANGE IMPACT=	12954.75	12954.75	1.00	900021.61	1096481.99	0.82

# FUEL USAGE COMPARISON - CLASS III (H)

PERIOD: VII

LOCATION: SYN CITY

RADIUS OF ACTION= 2.48 KILOMETERS

RESUPPLY DISTANCE= 4.18 KILOMETERS

LENGTH OF PERIOD= 25 DAYS

SYSTEM I.D.	QUANTITY IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
1	140	0.00	0.00	0.00	2406.88	14000.00	0.17
2	282	0.00	0.00	0.00	1347.10	25250.00	0.05
3	6	0.00	0.00	0.00	183.73	900.00	0.20
4	11	0.00	0.00	0.00	497.61	1300.00	0.38
5	5	0.00	0.00	0.00	68.90	215.00	0.31
6	24	0.00	0.00	0.00	106.06	700.00	0.15
7	391	0.00	0.00	0.00	5929.27	16871.24	0.35
8	48	0.00	0.00	0.00	484.60	1536.00	0.31
9	23	401.45	855.60	0.47	0.00	0.00	0.00
10	54	455.18	885.60	0.51	0.00	0.00	0.00
11	332	1399.26	3984.00	0.35	0.00	0.00	0.00
12	93	0.00	0.00	0.00	4464.00	4464.00	1.00
13	639	0.00	0.00	0.00	38340.00	38340.00	1.00
14	160	0.00	0.00	0.00	9600.00	9600.00	1.00
15	27	0.00	0.00	0.00	2592.00	2592.00	1.00
16	37	666.00	666.00	1.00	0.00	0.00	0.00
17	38	0.00	0.00	0.00	6080.00	6080.00	1.00
18	12	0.00	0.00	0.00	8400.00	8400.00	1.00
19	16	840.00	840.00	1.00	0.00	0.00	0.00
20	17	255.00	255.00	1.00	0.00	0.00	0.00
21	28	0.00	0.00	0.00	504.00	504.00	1.00
22	87	0.00	0.00	0.00	622.69	2732.26	0.22
23	28	0.00	0.00	0.00	896.00	896.00	1.00
CONSUMPTION TOTALS=		4619.43	8609.10	0.54	94809.30	154400.73	0.61
FOR 25 DAYS, TOTALS=		115485.69	215220.25		2370232.60	3860018.12	
MID-RANGE IMPACT =		2025.15	2025.15	1.00	97483.58	160984.71	0.61
FOR 25 DAYS, TOTALS=		50628.75	50628.75		2435089.54	4024617.62	

## SUPPORTING STORAGE AREA DEMAND

CONSUMPTION TOTAL=	115485.69	215220.25	0.54	2370232.60	3860018.12	0.61
MID-RANGE IMPACT=	50628.75	50628.75	1.00	2435089.54	4024617.62	0.61

# FUEL USAGE COMPARISON - CLASS III HD

PERIOD VII

LOCATION: SYN CITY

RADIUS OF ACTION= 2.40 KILOMETERS

RESUPPLY DISTANCE= 4.10 KILOMETERS

LENGTH OF PERIOD= 25 DAYS

SYSTEM	QUANTITY I.D. IN AREA	CALC. CONSUMPTION (MOGAS)	TAM CONSUMPTION (MOGAS)	RATIO OF CALC/TAM	CALC. CONSUMPTION (DIESEL)	TAM CONSUMPTION (DIESEL)	RATIO OF CALC/TAM
CONSUMPTION TOTALS=		4619.43	8683.13	0.54	94889.10	134400.73	0.71
FOR 25 DAYS TOTALS=		115485.69	215228.25		2370232.60	3360018.13	
MID-RANGE IMPACT =		2025.15	2025.15	1.00	97403.36	100084.71	0.97
FOR 25 DAYS TOTALS=		50628.75	50628.75		2435009.54	4024617.67	

## SUPPORTING STORAGE AREA DEMAND

CONSUMPTION TOTAL=	115485.69	215228.25	0.54	2370232.60	3360018.13	0.71
MID-RANGE IMPACT=	50628.75	50628.75	1.00	2435009.54	4024617.67	0.61

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  - 5-6 Air Reconnaissance
  - 6-1 Marine Division
  - 6-2 Marine Infantry Regiment
  - 7-1 Fire Support Coordination
  - 7-2 Naval Gunfire Support
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